039(28)Rec. 1

NASA SP-7039(28)
Section 1
Abstracts

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NASA PATENT ABSTRACTS BIBLIOGRAPHY

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Section 1 • Abstracts

JANUARY 1986

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

S1.21:

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04) SEC 1	N69-20701 – N73-33931
NASA SP-7039(12) SEC 1	N74-10001 – N77-34042
NASA SP-7039(13) SEC 1	N78-10001 – N78-22018
NASA SP-7039(14) SEC 1	N78-22019 – N78-34034
NASA SP-7039(15) SEC 1	N79-10001 – N79-21993
NASA SP-7039(16) SEC 1	N79-21994 – N79-34158
NASA SP-7039(17) SEC 1	N80-10001 – N80-22254
NASA SP-7039(18) SEC 1	N80-22255 – N80-34339
NASA SP-7039(19) SEC 1	N81-10001 – N81-21997
NASA SP-7039(20) SEC 1	N81-21998 – N81-34139
NASA SP-7039(21) SEC 1	N82-10001 – N82-22140
NASA SP-7039(22) SEC 1	N82-22141 – N82-34341
NASA SP-7039(23) SEC 1	N83-10001 – N83-23266
NASA SP-7039(24) SEC 1	N83-23267 – N83-37053
NASA SP-7039(25) SEC 1	N84-10001 – N84-22526
NASA SP-7039(26) SEC 1	N84-22527 – N84-35284
NASA SP-7039(27) SEC 1	N85-10001 – N85-22341
NASA SP-7039(28) SEC 1	N85-22342 – N85-36162

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NASA SP-7039(28)
Section 1
Abstracts

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between July 1985 and December 1985.

NASA Scientific and Technical Information Branch 1986
National Aeronautics and Space Administration
Washington, DC

This supplement is available as NASA SP-7039(28) SEC 1 from the National Technical Information Service (NTIS), Springfield, Virginia 22161. For information regarding the purchase price (which is subject to change), please write or call NTIS at (703) 487-4650.

INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB)* is a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract Section for all subsequent issues and the Index Section for the most recent issue.

The 109 citations published in this issue of the Abstract Section cover the period July 1985 through December 1985. The Index Section references over 4800 citations covering the period May 1969 through December 1985.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue incorporates the 1975 *STAR* category revisions which include 10 major subdivisions divided into 74 specific categories and one general category/division. (See Table of Contents for the scope note of each category under which are grouped appropriate NASA inventions.) This new scheme was devised in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and a key illustration taken from the patent or application for patent drawing. Entries are arranged in subject category in order of the ascending NASA Accession Number originally assigned in *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front cover.

Abstract Citation Data Elements: Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows:

NASA Accession Number
NASA Case Number
Inventor's Name
Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements in the citation of the abstract are depicted in the Typical Citation and Abstract reproduced on the following page and are also used in the indexes.

READEX MICROFICHE

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N85-19980*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SOURCE

TITLE

OVER THE WING PROPELLER Patent Application

INVENTORS

J. L. JOHNSON, JR. and E. R. WHITE, inventors (to NASA) (Kentron International, Inc., Hampton, Va.) 16 Oct. 1984 12 p

US PATENT APPLICATIONS SERIAL NUMBER

NASA CASE NUMBER

(NASA-CASE-LAR-13134-1; NAS 1.71:LAR-13134-1; US-PATENT-APPL-SN-661478) Avail: NTIS HC A02/MF A01

AVAILABILITY

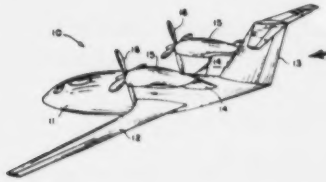
CSCL 01C

COSATI CODE

ABSTRACT

An aircraft system for increasing the lift drag ratio over a broad range of operating conditions is described. The system positions the engines and nacelles over the wing in such a position that gains in propeller efficiency is achieved simultaneously with increases in wing lift and a reduction in wing drag. Adverse structural and torsional effects on the wings are avoided by fuselage mounted pylons which attach to the upper portion of the fuselage aft of the wings. Similarly, pylon wing interference is eliminated by moving the pylons to the fuselage. Further gains are achieved by locating the pylon surface area aft of the aircraft center of gravity, thereby augmenting both directional and longitudinal stability. This augmentation has the further effect of reducing the size, weight and drag of empennage components. The combination of design changes results in improved cruise performance and increased climb performance while reducing fuel consumption and drag and weight penalties. NASA

KEY ILLUSTRATION



INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes which are cross-indexed and are useful in locating a single invention or groups of inventions.

Each of the five indexes utilizes basic data elements: (1) Subject Category Number, (2) NASA Accession Number, and (3) NASA Case Number, in addition to other specific index terms.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial Number, (3) U.S. Patent Classification Number, and (4) U.S. Patent Number and indicates the related Subject Category Number and the NASA Accession Number.

Accession Number Index: Lists all inventions in order of ascending NASA Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S. Patent Classification Number, and the U.S. Patent Number.

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible when using the flexibility incorporated into the *NASA PAB.*

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB,* select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired. (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (i) use the Subject Category Number to locate the Subject Category and (ii) use the Accession Number to locate the desired invention within the Subject Category listing.

(3) *Using Patent Classification Index:* To identify all inventions covered by issued NASA patents (does not include applications for patent) within a desired Patent Classification, (A) turn to the Patent Classification Number in the Number Index of Section 2 and find the associated invention(s), and (B) follow the instructions outlined in (2)(B), and (D) above.

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

Copies of U.S. patents may be purchased directly from the U.S. Patent and Trademark Office, Washington, D.C. 20231. When ordering patents, the U.S. Patent Number should be used, and payment must be remitted in advance, preferably by money order or check payable to the Commissioner of Patents and Trademarks. Prepaid purchase coupons for ordering are also available from the Patent and Trademark Office.

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02. Microfiche are sold at price code A01. The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

NASA inventions, abstracted in *NASA PAB,* are available for nonexclusive or exclusive licensing in accordance with the NASA Patent Licensing Regulations. It is significant that all licenses for NASA inventions shall be by express written instruments and that no license will be granted or implied in a NASA invention except as provided in the NASA Patent Licensing Regulations.

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Assistant General Counsel for Patent Matters, Code GP, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB.*

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table.

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415) 965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP-4 Washington, D.C. 20546 Telephone: (202) 755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301) 344-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: PT-PAT Kennedy Space Center, Florida 32899 Telephone: (305) 867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 279 Hampton, Virginia 23365 Telephone: (804) 827-8725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-318 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216) 433-6346
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AL3 Houston, Texas 77058 Telephone: (713) 483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205) 453-0020
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-801 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (213)354-2700

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC: NASA and NASA-sponsored documents and a large number of aerospace publications are available to the public for reference purposes at the library maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

EUROPEAN: An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England for public access. The British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols # and * from ESA — Information Retrieval Service European Space Agency, 8-10 rue Mario-Nikis, 75738 CEDEX 15, France.

FEDERAL DEPOSITORY LIBRARY PROGRAM

In order to provide the general public with greater access to U.S. Government publications, Congress established the Federal Depository Library Program under the Government Printing Office (GPO), with 50 regional depositories responsible for permanent retention of material, inter-library loan, and reference services. Over 1,300 other depositories also exists. A list of the regional GPO libraries appears on the inside back cover.

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

14 CFR Part 1245

Licensing of NASA Inventions

AGENCY: National Aeronautics and Space Administration.

ACTION: Interim regulation with comments requested.

SUMMARY: The National Aeronautics and Space Administration (NASA) is revising its patent licensing regulations to conform with Pub. L. 96-517. This interim regulation provides policies and procedures applicable to the licensing of federally owned inventions in the custody of the National Aeronautics and Space Administration, and implements Pub. L. 96-517. The object of this subpart is to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

EFFECTIVE DATE: July 1, 1981. Comments must be received in writing by December 2, 1981. Unless a notice is published in the **Federal Register** after the comment period indicating changes to be made, this interim regulation shall become a final regulation.

ADDRESS: Mr. John G. Mannix, Director of Patent Licensing, GP-4, NASA, Washington, D.C. 20546.

FOR FURTHER INFORMATION CONTACT: Mr. John G. Mannix, (202) 755-3954.

SUPPLEMENTARY INFORMATION:

PART 1245—PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

Subpart 2 of Part 1245 is revised to read as follows

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Subpart 2—Licensing of NASA Inventions

Sec.

1245.200 Scope of subpart.
1245.201 Policy and objective.
1245.202 Definitions.
1245.203 Authority to grant licenses.

Restrictions and Conditions

1245.204 All licenses granted under this subpart.

Types of Licenses

1245.205 Nonexclusive licenses.
1245.206 Exclusive and partially exclusive licenses.

Procedures

1245.207 Application for a license.
1245.208 Processing applications.
1245.209 Notice to Attorney General.
1245.210 Modification and termination of licenses.
1245.211 Appeals.
1245.212 Protection and administration of inventions.
1245.213 Transfer of custody.
1245.214 Confidentiality of information.

Authority: 35 U.S.C. Section 207 and 208, 94 Stat. 3023 and 3024.

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Subpart 2—Licensing of NASA Inventions

§ 1245.200 Scope of subpart.

This subpart prescribes the terms, conditions, and procedures upon which a NASA invention may be licensed. It does not affect licenses which (a) were in effect prior to July 1, 1981; (b) may exist at the time of the Government's acquisition of title to the invention, including those resulting from the allocation of rights to inventions made under Government research and development contracts, (c) are the result of an authorized exchange of rights in the settlement of patent disputes; or (d) are otherwise authorized by law or treaty.

§ 1245.201 Policy and objective.

It is the policy and objective of this subpart to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

§ 1245.202 Definitions.

(a) "Federally owned invention" means an invention, plant, or design which is covered by a patent, or patent application in the United States, or a patent, patent application, plant variety protection, or other form of protection, in a foreign country, title to which has been assigned to or otherwise vested in the United States Government.

(b) "Federal agency" means an executive department, military department, Government corporation, or independent establishment, except the Tennessee Valley Authority, which has custody of a Federally owned invention.

(c) "NASA Invention" means a Federally owned invention with respect to which NASA maintains custody and administration, in whole or in part, of the right, title, or interest in such invention on behalf of the United States Government.

(d) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of these regulations, the size standard for small business concerns involved in Government procurement, contained in 13 C.F.R. 121.3-8, and in subcontracting, contained in 13 CFR 121.3-12, will be used.

(e) "Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

(f) "United States" means the United States of America, its territories and possessions, the District of Columbia, and the Commonwealth of Puerto Rico.

§ 1245.203 Authority to grant licenses.

NASA inventions shall be made available for licensing as deemed appropriate in the public interest. NASA may grant nonexclusive, partially exclusive, or exclusive licenses thereto under this subpart on inventions in its custody.

Restrictions and Conditions

§ 1245.204 All licenses granted under this subpart.

(a) *Restrictions.* (1) A license may be granted only if the applicant has supplied NASA with a satisfactory plan for development or marketing of the invention, or both, and with information about the applicant's capability to fulfill the plan.

(2) A license granting rights to use or sell under a NASA invention in the United States shall normally be granted only to a licensee who agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

(b) *Conditions.* Licenses shall contain such terms and conditions as NASA determines are appropriate for the protection of the interests of the Federal Government and the public and are not in conflict with law or this subpart. The following terms and conditions apply to any license:

(1) The duration of the license shall be for a period specified in the license agreement, unless sooner terminated in accordance with this subpart.

(2) The license may be granted for all or less than all fields of use of the invention or in specified geographical areas, or both.

(3) The license may extend to subsidiaries of the licensee or other parties if provided for in the license but shall be nonassignable without approval of NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(4) The license may provide the licensee the right to grant sublicenses under the license, subject to the approval of NASA. Each sublicense shall make reference to the license, including the rights retained by the Government, and a copy of such

sublicense shall be furnished to NASA.

(5) The license shall require the licensee to carry out the plan for development or marketing of the invention, or both, to bring the invention to practical application within a period specified in the license, and to continue to make the benefits of the invention reasonably accessible to the public.

(6) The license shall require the licensee to report periodically on the utilization or efforts at obtaining utilization that are being made by the licensee, with particular reference to the plan submitted.

(7) All licenses shall normally require royalties or other consideration.

(8) Where an agreement is obtained pursuant to § 1245.204(a)(2) that any products embodying the invention or produced through use of the invention will be manufactured substantially in the United States, the license shall recite such agreement.

(9) The license shall provide for the right of NASA to terminate the license, in whole or in part, if:

(i) NASA determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of NASA that it has taken or can be expected to take within a reasonable time effective steps to achieve practical application of the invention;

(ii) NASA determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee;

(iii) The licensee has willfully made a false statement of or willfully omitted a material fact in the license application or in any report required by the license agreement; or

(iv) The licensee commits a substantial breach of a covenant or agreement contained in the license.

(10) The license may be modified or terminated, consistent with this subpart, upon mutual agreement of NASA and the licensee.

(11) Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to this subpart shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

Types of Licenses

§ 1245.205 Nonexclusive licenses.

(a) *Availability of licenses.* Nonexclusive licenses may be granted under NASA inventions without publication of availability or notice of a prospective license.

(b) *Conditions.* In addition to the provisions of § 1245.204, the nonexclusive license may also provide that, after termination of a period specified in the license agreement, NASA may restrict the license to the fields of use or geographic areas, or both, in which the licensee has brought the invention to practical application and continues to make the benefits of the invention reasonably accessible to the public. However, such restriction shall be made only in order to grant an exclusive or partially exclusive license in accordance with this subpart.

§ 1245.206 Exclusive and partially exclusive licenses.

(a) Domestic licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on NASA inventions: (i) 3 months after notice of the invention's availability has been announced in the **Federal Register**; or (ii) without such notice where NASA determines that expeditious granting of such a license will best serve the interests of the Federal Government and the public; and (iii) in either situation, specified in (a)(1)(i) or (ii) of this section only if:

(A) Notice of a prospective license, identifying the invention and the prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections within a 60-day period;

(B) After expiration of the period in § 1245.206(a)(1)(iii)(A) and consideration of nay written objections received during the period, NASA has determined that:

(*1*) The interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

(*2*) The desired practial application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(*3*) Exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

(*4*) The proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public;

(C) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws; and

(D) NASA has given first preference to any small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to domestic exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall reserve to NASA the right to require the licensee to grant sublicenses to responsible applicants, on reasonable terms, when necessary to fulfill health or safety needs.

(iii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iv) The license may grant the licensee the right of enforcement of the licensed patent pursuant to the provisions of Chapter 29 of Title 35, United States Code, or other statutes, as determined appropriate in the public interest.

(b) Foreign licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on a NASA invention covered by a foreign patent, patent application, or other form of protection, provided that:

(i) Notice of a prospective license, identifying the invention and prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections

within a 60-day period and following consideration of such objections;

(ii) NASA has considered whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced; and

(iii) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to foreign exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iii) The license may grant the licensee the right to take any suitable and necessary actions to protect the licensed property, on behalf of the Federal Government.

(c) *Record of determinations.* NASA shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Procedures

§ 1245.207 Application for a license.

An application for a license should be addressed to the Patent Counsel at the NASA installation having responsibility for the invention and shall normally include:

(a) Identification of the invention for which the license is desired, including the patent application serial number or patent number, title, and date, if known;

(b) Identification of the type of license for which the application is submitted;

(c) Name and address of the person, company, or organization applying for the license and the citizenship or place of incorporation of the applicant;

(J) Name, address, and telephone number of representative of applicant to whom correspondence should be sent;

(e) Nature and type of applicant's business, identifying products or services which the applicant has successfully commercialized, and approximate number of applicant's employees;

(f) Source of information concerning the availability of a license on the invention;

(g) A statement indicating whether applicant is a small business firm as defined in § 1245.202(c);

(h) A detailed description of applicant's plan for development or marketing of the invention, or both, which should include:

(1) A statement of the time, nature and amount of anticipated investment of capital and other resources which applicant believes will be required to bring the invention to practical application;

(2) A statement as to applicant's capability and intention to fulfill the plan, including information regarding manufacturing, marketing, financial, and technical resources;

(3) A statement of the fields of use for which applicant intends to practice the invention; and

(4) A statement of the geographic areas in which applicant intends to manufacture any products embodying the invention and geographic areas where applicant intends to use or sell the invention, or both;

(i) Identification of licenses previously granted to applicant under Federally owned inventions;

(j) A statement containing applicant's best knowledge of the extent to which the invention is being practiced by private industry or Government, or both, or is otherwise available commercially; and

(k) Any other information which applicant believes will support a determination to grant the license to applicant.

§ 1245.208 Processing applications.

(a) Applications for licenses will be initially reviewed by the Patent Counsel of the NASA installation having responsibility for the invention. The Patent Counsel shall make a preliminary recommendation to the Director of Licensing, NASA Headquarters, whether to: (1) grant the license as requested, (2) grant the license with modification after negotiation with the licensee, or (3) deny the license. The Director of Licensing shall review the preliminary recommendation of the Patent Counsel and make a final recommendation to the NASA Assistant General Counsel for Patent Matters. Such review and final recommendation may include, and be based on, any additional information obtained from applicant and other sources that the Patent Counsel and the Director of Licensing deem relevant to the license requested. The determination to grant or deny the license shall be made by the Assistant General Counsel for Patent Matters based on the final recommendation of the Director of Licensing.

(b) When notice of a prospective exclusive or partially exclusive license is published in the Federal Register in accordance with § 1245.206(a)(1)(iii)(A) or § 1245.206(b)(1)(i), any written objections received in response thereto will be considered by the Director of Licensing in making the final recommendation to the Assistant General Counsel for Patent Matters.

(c) If the requested license, including any negotiated modifications, is denied by the Assistant General Counsel for Patent Matters, the applicant may request reconsideration by filing a written request for reconsideration within 30 days after receiving notice of denial. This 30-day period may be extended for good cause.

(d) In addition to, or in lieu of requesting reconsideration, the applicant may also appeal the denial of the license in accordance with § 1245.211.

§ 1245.209 Notice to Attorney General.

A copy of the notice provided for in §§ 1245.206(a)(1)(iii)(A), and 1245.206(b)(1)(i) will be sent to the Attorney General.

§ 1245.210 Modification and termination of licenses.

Before modifying or terminating a license, other than by mutual agreement, NASA shall furnish the licensee and any sublicensee of record a written notice of intention to modify or terminate the license, and the licensee and any sublicensee shall be allowed 30 days after such notice to remedy any breach of the license or show cause why the license should not be modified or terminated.

§ 1245.211 Appeals.

(a) The following parties may appeal to the NASA Administrator or designee any decision or determination concerning the grant, denial, interpretation, modification, or termination of a license:

(1) A person whose application for a license has been denied;

(2) A licensee whose license has been modified or terminated, in whole or in part; or

(3) A person who timely filed a written objection in response to the notice required by §§ 1245.206(a)(1)(iii)(A) or

1245.206(b)(1)(i) and who can demonstrate to the satisfaction of NASA that such person may be damaged by the Agency action.

(b) Written notice of appeal must be filed within 30 days (or such other time as may be authorized for good cause shown) after receiving notice of the adverse decision or determination; including, an adverse decision following the request for reconsideration under § 1245.208(c). The notice of appeal, along with all supporting documentation should be addressed to the Administrator, National Aeronautics and Space Administration, Washington. DC 20546. Should the appeal raise a genuine dispute over material facts, fact-finding will be conducted by the NASA Inventions and Contributions Board. The person filing the appeal shall be afforded an opportunity to be heard and to offer evidence in support of the appeal. The Chairperson of the Inventions and Contributions Board shall prepare written findings of fact and transmit them to the Administrator or designee. The decision on the appeal shall be made by the NASA Administrator or designee. There is no further right of administrative appeal from the decision of the Administrator or designee.

§ 1245.212 Protection and administration of inventions.

NASA may take any suitable and necessary steps to protect and administer rights to NASA inventions, either directly or through contract.

§ 1245.213 Transfer of custody.

NASA having custody of certain Federally owned inventions may transfer custody and administration in whole or in part, to another Federal agency, of the right, title, or interest in any such invention.

§ 1245.214 Confidentiality of information.

Title 35, United States Code, section 209, provides that any plan submitted pursuant to § 1245.207(h) and any report required by § 1245.204(b)(6) may be treated by NASA as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of Title 5 of the United States Code.

James M. Beggs,

Administrator.

October 15, 1981.

[FR Doc. 81-31600 Filed 10-30-81; 8:45 am]

BILLING CODE 7510-01-M

TABLE OF CONTENTS

Section 1 • Abstracts

AERONAUTICS

Includes aeronautics (general); aerodynamics; air transportation and safety; aircraft communications and navigation; aircraft design, testing and performance; aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air).

For related information see also *Astronautics*.

01 AERONAUTICS (GENERAL) **N.A.**

02 AERODYNAMICS **1**

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer*

03 AIR TRANSPORTATION AND SAFETY **N.A.**

Includes passenger and cargo air transport operations; and aircraft accidents.

For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation.*

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION **N.A.**

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

For related information see also *17 Spacecraft Communications, Command and Tracking* and *32 Communications.*

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE **1**

Includes aircraft simulation technology.

For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics.*

06 AIRCRAFT INSTRUMENTATION **N.A.**

Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography.*

07 AIRCRAFT PROPULSION AND POWER **1**

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

For related information see also *20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

08 AIRCRAFT STABILITY AND CONTROL **2**

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

09 RESEARCH AND SUPPORT FACILITIES (AIR) **2**

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

For related information see also *14 Ground Support Systems and Facilities (Space).*

ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

For related information see also *Aeronautics*

12 ASTRONAUTICS (GENERAL) **N.A.**

For extraterrestrial exploration see *91 Lunar and Planetary Exploration.*

13 ASTRODYNAMICS **N.A.**

Includes powered and free-flight trajectories; and orbit and launching dynamics.

14 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE) **N.A.**

Includes launch complexes, research and production facilities; ground support equipment, e.g., mobile transporters; and simulators.

For related information see also *09 Research and Support Facilities (Air).*

15 LAUNCH VEHICLES AND SPACE VEHICLES **N.A.**

Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

16 SPACE TRANSPORTATION **N.A.**

Includes passenger and cargo space transportation, e.g., shuttle operations; and rescue techniques.

For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation.*

17 SPACECRAFT COMMUNICATION, COMMAND AND TRACKING **N.A.**

Includes telemetry; space communications networks; astronavigation; and radio blackout.

For related information see also *04 Aircraft Communications and Navigation* and *32 Communications.*

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE **3**

Includes spacecraft thermal and environmental control; and attitude control.

For life support systems see *54 Man/System Technology and Life Support.* For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics.*

19 SPACECRAFT INSTRUMENTATION **N.A.**

For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography.*

20 SPACECRAFT PROPULSION AND POWER **N.A.**

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

For related information see also *07 Aircraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

CHEMISTRY AND MATERIALS

Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; and propellants and fuels.

23 CHEMISTRY AND MATERIALS (GENERAL) 3
Includes biochemistry and organic chemistry.

24 COMPOSITE MATERIALS 4
Includes laminates.

25 INORGANIC AND PHYSICAL CHEMISTRY 5
Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.
For related information see also *77 Thermodynamics and Statistical Physics.*

26 METALLIC MATERIALS 6
Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

27 NONMETALLIC MATERIALS 7
Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

28 PROPELLANTS AND FUELS N.A.
Includes rocket propellants, igniters, and oxidizers; storage and handling; and aircraft fuels.
For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power,* and *44 Energy Production and Conversion.*

ENGINEERING

Includes engineering (general); communications; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.
For related information see also *Physics.*

31 ENGINEERING (GENERAL) 8
Includes vacuum technology; control engineering; display engineering; and cryogenics.

32 COMMUNICATIONS 9
Includes land and global communications; communications theory; and optical communications.
For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

33 ELECTRONICS AND ELECTRICAL ENGINEERING 11
Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.
For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics.*

34 FLUID MECHANICS AND HEAT TRANSFER 15
Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.
For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics.*

35 INSTRUMENTATION AND PHOTOGRAPHY 17
Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.
For aerial photography see *43 Earth Resources.* For related information see also *06 Aircraft Instrumentation* and *19 Spacecraft Instrumentation.*

36 LASERS AND MASERS 21
Includes parametric amplifiers.

37 MECHANICAL ENGINEERING 22
Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

38 QUALITY ASSURANCE AND RELIABILITY N.A.
Includes product sampling procedures and techniques; and quality control.

39 STRUCTURAL MECHANICS N.A.
Includes structural element design and weight analysis; fatigue; and thermal stress.
For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance.*

GEOSCIENCES

Includes geosciences (general); earth resources; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.
For related information see also *Space Sciences.*

42 GEOSCIENCES (GENERAL) N.A.

43 EARTH RESOURCES N.A.
Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.
For instrumentation see *35 Instrumentation and Photography.*

44 ENERGY PRODUCTION AND CONVERSION 29
Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.
For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

45 ENVIRONMENT POLLUTION N.A.
Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

46 GEOPHYSICS **N.A.**
Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.
For space radiation see *93 Space Radiation.*

47 METEOROLOGY AND CLIMATOLOGY **N.A.**
Includes weather forecasting and modification.

48 OCEANOGRAPHY **N.A.**
Includes biological, dynamic and physical oceanography; and marine resources.

LIFE SCIENCES

Includes sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and planetary biology.

51 LIFE SCIENCES (GENERAL) **N.A.**
Includes genetics.

52 AEROSPACE MEDICINE 30
Includes physiological factors; biological effects of radiation; and weightlessness.

53 BEHAVIORAL SCIENCES **N.A.**
Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT **N.A.**
Includes human engineering; biotechnology; and space suits and protective clothing.

55 PLANETARY BIOLOGY **N.A.**
Includes exobiology; and extraterrestrial life.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL) **N.A.**

60 COMPUTER OPERATIONS AND HARDWARE 30
Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering.*

61 COMPUTER PROGRAMMING AND SOFTWARE **N.A.**
Includes computer programs, routines, and algorithms.

62 COMPUTER SYSTEMS **N.A.**
Includes computer networks.

63 CYBERNETICS **N.A.**
Includes feedback and control theory.
For related information see also *54 Man/System Technology and Life Support.*

64 NUMERICAL ANALYSIS **N.A.**
Includes iteration, difference equations, and numerical approximation.

65 STATISTICS AND PROBABILITY **N.A.**
Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

66 SYSTEMS ANALYSIS **N.A.**
Includes mathematical modeling; network analysis; and operations research.

67 THEORETICAL MATHEMATICS **N.A.**
Includes topology and number theory.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering.*

70 PHYSICS (GENERAL) **N.A.**
For geophysics see *46 Geophysics.* For astrophysics see *90 Astrophysics.* For solar physics see *92 Solar Physics.*

71 ACOUSTICS 31
Includes sound generation, transmission, and attenuation.
For noise pollution see *45 Environment Pollution.*

72 ATOMIC AND MOLECULAR PHYSICS 32
Includes atomic structure and molecular spectra.

73 NUCLEAR AND HIGH-ENERGY PHYSICS **N.A.**
Includes elementary and nuclear particles; and reactor theory.
For space radiation see *93 Space Radiation.*

74 OPTICS 32
Includes light phenomena.

75 PLASMA PHYSICS **N.A.**
Includes magnetohydrodynamics and plasma fusion.
For ionospheric plasmas see *46 Geophysics.* For space plasmas see *90 Astrophysics.*

76 SOLID-STATE PHYSICS 34
Includes superconductivity.
For related information see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

77 THERMODYNAMICS AND STATISTICAL PHYSICS **N.A.**
Includes quantum mechanics; and Bose and Fermi statistics.
For related information see also *25 Inorganic and Physical Chemistry* and *34 Fluid Mechanics and Heat Transfer.*

SOCIAL SCIENCES

Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law and political science; and urban technology and transportation.

80 SOCIAL SCIENCES (GENERAL) **N.A.**
Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT **N.A.**
Includes management planning and research.

82 DOCUMENTATION AND INFORMATION SCIENCE **N.A.**
Includes information storage and retrieval technology; micrography; and library science.
For computer documentation see *61 Computer Programming and Software.*

83 ECONOMICS AND COST ANALYSIS **N.A.**
Includes cost effectiveness studies.

84 LAW AND POLITICAL SCIENCE **N.A.**
Includes space law; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION **36**
Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.
For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion.*

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.
For related information see also *Geosciences.*

88 SPACE SCIENCES (GENERAL) **N.A.**

89 ASTRONOMY **N.A.**
Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

90 ASTROPHYSICS **N.A.**
Includes cosmology; and interstellar and interplanetary gases and dust.

91 LUNAR AND PLANETARY EXPLORATION **N.A.**
Includes planetology; and manned and unmanned flights.
For spacecraft design see *18 Spacecraft Design, Testing and Performance.* For space stations see *15 Launch Vehicles and Space Vehicles.*

92 SOLAR PHYSICS **N.A.**
Includes solar activity, solar flares, solar radiation and sunspots.

93 SPACE RADIATION **N.A.**
Includes cosmic radiation; and inner and outer earth's radiation belts.
For biological effects of radiation see *52 Aerospace Medicine.* For theory see *73 Nuclear and High-Energy Physics.*

GENERAL

99 GENERAL **N.A.**

Note: N.A. means that no abstracts were assigned to this category for this issue.

Section 2 • Indexes

SUBJECT INDEX
INVENTOR INDEX
SOURCE INDEX
CONTRACT NUMBER INDEX
NUMBER INDEX
ACCESSION NUMBER INDEX

JANUARY 1986 (Supplement 28)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

02

AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

N85-28922*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COMBINED RIBLET AND LEBU DRAG REDUCTION SYSTEM Patent Application
M. J. WALSH, J. N. HEFNER, and J. B. ANDERS, inventors (to NASA) 27 Dec. 1984 17 p
(NASA-CASE-LAR-13286-1; NAS 1.71:LAR-13286-1; US-PATENT-APPL-SN-686959) Avail: NTIS HC A02/MF A01 CSCL 01A

The invention is a system of flow control devices which result in reduced skin friction on aerodynamic and hydrodynamic surfaces. The devices cause a breakup of large-scale disturbances in the boundary layer of the flow field. The riblet device acts to reduce disturbances near the boundary layer wall by the use of longitudinal striations forming vee-shaped grooves. These grooves are dimensional on the order of the wall vortices and turbulent burst dimensions. The large eddy breakup device is a small strip or airfoil which is suspended in the upper region of the boundary layer. Various physical mechanisms cause a disruption of the large scale vortices. The combination of the devices of this invention result in a substantial reduction in skin friction drag. NASA

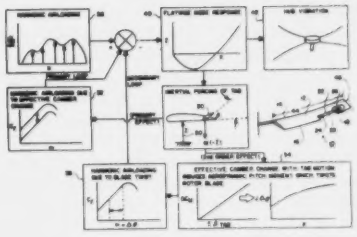
05

AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

N85-29947* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AIRCRAFT ROTOR BLADE WITH PASSIVE TUNED TAB Patent
T. G. CAMPBELL, inventor (to NASA) (Sikorsky Aircraft, Stratford, Conn.) 30 Apr. 1985 10 p Filed 28 Apr. 1983 Sponsored by NASA
(NASA-CASE-ARC-11444-1; US-PATENT-4,514,143; US-PATENT-APPL-SN-489675; US-PATENT-CLASS-416-23; US-PATENT-CLASS-416-145; US-PATENT-CLASS-416-500) Avail: US Patent and Trademark Office CSCL 01C

A structure for reducing vibratory airloading in a rotor blade with a leading edge and a trailing edge includes a cut out portion at the trailing edge. A substantially wedge shaped cross section, inertially deflectable tab, also with a leading edge and a trailing edge is pivotally mounted in the cut out portion. The trailing edge of the tab may move above and below the rotor blade. A torsion strap applies force against the tab when the trailing edge of the tab is above and below the rotor blade. A restraining member is slidably movable along the torsion strap to vary torsional biasing force supplied by the torsion bar to the tab. A plurality of movable weights positioned between plates vary a center of gravity of the tab. Skin of the tab is formed from unidirectional graphite and fiberglass layers. Sliders coupled with a pinned degree of freedom at rod eliminate bending of tab under edgewise blade deflection.
Official Gazette of the U.S. Patent and Trademark Office



07

AIRCRAFT PROPULSION AND POWER

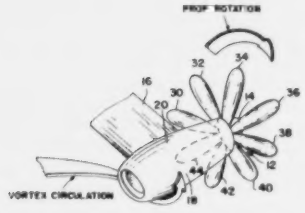
Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

N85-35194* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WINGTIP VORTEX PROPELLER Patent
J. C. PATTERSON, JR., inventor (to NASA) 6 Aug. 1985 9 p Filed 2 Feb. 1984 Supersedes N84-20495 (22 - 11, p 1602)
(NASA-CASE-LAR-13019-1; US-PATENT-4,533,101; US-PATENT-APPL-SN-576308; US-PATENT-CLASS-244-199; US-PATENT-CLASS-244-55) Avail: US Patent and Trademark Office CSCL 01C

A device which increases the energy efficiency of aircraft wherein a wingtip pusher propeller is positioned aft of the wingtip

to rotate in the crossflow of the wingtip vortex is presented. The propeller rotates against the vortex swirl creating additional thrust from and attenuating the wingtip vortex by simultaneously extracting energy from the vortex and converting it to propeller blade induced thrust while injecting its high energy wake into the vortex axial flow to dissipate the vortex. The device increases aircraft fuel efficiency by simultaneously increasing thrust and decreasing vortex induced drag. By attenuating the vortex safety to following aircraft is maximized.

Official Gazette of the U.S. Patent and Trademark Office



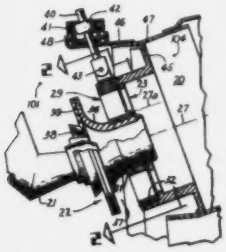
N85-35195* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

FLOW MODIFYING DEVICE Patent

J. S. KELM (General Electric Co., Cincinnati), E. C. VICKERS (General Electric Co., Cincinnati), J. J. WILLIAMS (General Electric Co., Cincinnati), and J. R. TAYLOR, inventors (to NASA) (General Electric Co., Cincinnati) 13 Aug. 1985 10 p Continuation of abandoned US-Patent-Appl-SN-192677 filed 1 Oct. 1980 (NASA-CASE-LEW-13562-2; US-PATENT-4,534,166; US-PATENT-APPL-SN-500651; US-PATENT-CLASS-60-39.23; US-PATENT-CLASS-60-748; US-PATENT-CLASS-239-402.5) Avail: US Patent and Trademark Office CSCL 21E

A swirler for a gas turbine engine combustor is disclosed for simultaneously controlling combustor flow rate, swirl angle, residence time and fuel-air ratio to provide three regimes of operation. A first regime is provided in which fuel-air ratio is less than stoichiometric, NOx is produced at one level, and combustor flow rate is high. In a second regime, fuel-air ratio is nearly stoichiometric, NOx production is less than that of the first regime, and combustor flow rate is low. In a third regime, used for example at highoff, fuel-air ratio is greater than stoichiometric and the combustor flow rate is less than in either of the other regimes.

Author



08

AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

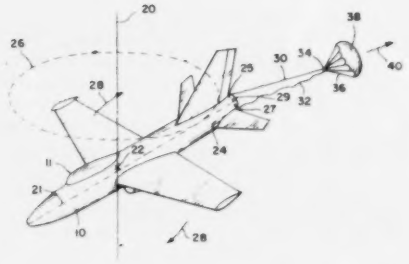
N85-35200* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

DUAL TOWLINE SPIN-RECOVERY DEVICE Patent

W. L. WHITE, inventor (to NASA) 3 Sep. 1985 9 p Filed 15 Sep. 1983 Supersedes N83-34934 (21 - 23, p 3738) (NASA-CASE-LAR-13076-1; US-PATENT-4,538,778; US-PATENT-APPL-SN-532342; US-PATENT-CLASS-244-75-R; US-PATENT-CLASS-244-139; US-PATENT-CLASS-244-113) Avail: US Patent and Trademark Office CSCL 01C

A device which corrects aerodynamic spin is described wherein a parachute exerts antispin forces on an aircraft to effect spin recovery. The dual parachute towlines and are each attached to the parachute and are attached to the rear fuselage equidistant to and on opposite sides of the aircraft centerline. As the parachute is deployed during spin, the parachute force acts through only the towing and exerts its force outboard of center on the aircraft. As a result, the parachute exerts not only an antispin torque, but additionally causes the aircraft to roll, creating a gyroscopic antispin rolling moment. The additional antispin rolling moment facilitates spin recovery by permitting a relatively smaller parachute to accomplish spin recovery equivalent to that of a larger parachute attached to the center of the rear fuselage.

Official Gazette of the U.S. Patent and Trademark Office



09

RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

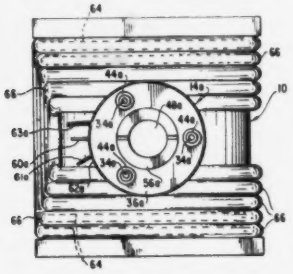
N85-28951*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

DOUBLE WINDOW VIEWING CHAMBER ASSEMBLY Patent Application

V. W. KELLER, R. B. QUEEN, B. R. ELKIN, and W. L. WHITE, inventors (to NASA) 2 May 1985 12 p (NASA-CASE-MFS-28057-1; NAS 1.71:MFS-28057-1; US-PATENT-APPL-SN-729766) Avail: NTIS HC A02/MF A01 CSCL 14B

A viewing chamber which permits observation of a sample retained therein includes a pair of double window assemblies mounted in opposed openings in the walls thereof so that a light beam can directly enter and exit from the chamber. A flexible mounting arrangement for the outer windows of the window assemblies enables the windows to be brought into proper

alignment. An electrical heating arrangement prevents fogging of the outer windows whereas desiccated air in the volume between the outer and inner windows prevents fogging of the latter.
NASA



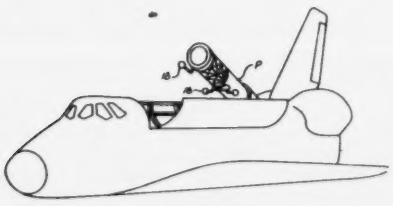
18

SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

N85-29991* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HEMISPHERICAL LATCHING APPARATUS Patent
K. H. CLARK, inventor (to NASA) 2 Apr. 1985 17 p Filed 23 Jul. 1982 Supersedes N82-31398 (20 - 22, p 3093)
(NASA-CASE-MFS-25837-1; US-PATENT-4,508,296;
US-PATENT-APPL-SN-401282; US-PATENT-CLASS-244-158R;
US-PATENT-CLASS-244-118.1; US-PATENT-CLASS-248-503;
US-PATENT-CLASS-248-555; US-PATENT-CLASS-403-56;
US-PATENT-CLASS-403-76; US-PATENT-CLASS-403-90;
US-PATENT-CLASS-403-143; US-PATENT-CLASS-410-79;
US-PATENT-CLASS-410-90) Avail: US Patent and Trademark Office CSCL 22B

An apparatus for securing payloads in a space vehicle such as the space shuttle is described. The apparatus includes many latching assemblies carried by a platform on the vehicle and a like number of latching elements carried by the payload and adapted to mate with the latching assemblies. The novelty of the invention is believed to reside in the use of complementary hemispherical elements which automatically align and engage with one another. This enables a simple but effective mode of operation and avoids the need for hinged linkages and similar moving parts.
Author



23

CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N85-28973* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PHENOXY RESINS CONTAINING PENDENT ETHYNYL GROUPS AND CURED RESINS OBTAINED THEREFROM Patent
P. M. HERGENROTHER, inventor (to NASA) 9 Apr. 1985 8 p Filed 10 May 1984 Sponsored by NASA
(NASA-CASE-LAR-13262-1; US-PATENT-4,510,296;
US-PATENT-APPL-SN-608741; US-PATENT-CLASS-525-534;
US-PATENT-CLASS-525-532; US-PATENT-CLASS-528-86)
Avail: US Patent and Trademark Office CSCL 07C

Phenoxy resins containing pendent ethynyl groups, the process for preparing the same, and the cured resin products obtained therefrom are disclosed. Upon the application of heat, the ethynyl groups react to provide branching and crosslinking with the cure temperature being lowered by using a catalyst if desired but not required. The cured phenoxy resins containing pendent ethynyl groups have improved solvent resistance and higher use temperature than linear uncrosslinked phenoxy resins and are applicable for use as coatings, films, adhesives, composited matrices and molding compounds.
Author

N85-33187* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SYNTHESIS OF 2,4,8,10-TETROXASPIRO5,5UNDECANE Patent
A. C. POSHKUS, inventor (to NASA) (NAS/NRC, Washington) 9 Jul. 1985 5 p Filed 3 Sep. 1980 Supersedes N80-31472 (18 - 22, p 2964)
(NASA-CASE-ARC-11243-2; US-PATENT-4,528,386;
US-PATENT-APPL-SN-183707; US-PATENT-CLASS-549-335)
Avail: US Patent and Trademark Office CSCL 07C

Pentaerythritol is converted to its diformal, 2,4,8,10-tetroxaspirol5.5undecane, by heating it to a temperature within the range of about 110 to 150 C, for a period of up to 10 minutes, in the presence of a slight excess of paraformaldehyde and of a catalytic quantity of an acid catalyst such as sulfuric acid. The reaction may be carried out in two steps, by forming first the monoformal, then the diformal. In any case, total reaction time is about 10 minutes, and yield of diformal are greater than 90%. Previous processes require hours or days, and often, tedious operating procedures.
Author

N85-35227* National Aeronautics and Space Administration. Pasadena Office, Calif.
PRODUCTION OF BUTANOL BY FERMENTATION IN THE PRESENCE OF COCULTURES OF CLOSTRIDIUM Patent
S. L. BERGSTROM (JPL, Pasadena, Calif.) and G. L. FOUTCH, inventors (to NASA) (JPL, Pasadena, Calif.) 3 Sep. 1985 4 p Filed 10 May 1983 Supersedes N83-29806 (21 - 18, p 2962)
(NASA-CASE-NPO-16203-1; US-PATENT-4,539,293;
US-PATENT-APPL-SN-493179; US-PATENT-CLASS-435-160;
US-PATENT-CLASS-435-842) Avail: US Patent and Trademark Office CSCL 07C

Sugars are converted to a mixture of solvents including butanol by a fermentation process employing a coculture of microorganisms of the Clostridium genus, one of said microorganisms favoring the production of butyric acid and the other of which converts the butyric acid so produced to butanol. The use of a coculture substantially increases the yield of butanol over that obtained using a culture employing only one microorganism.
Official Gazette of the U.S. Patent and Trademark Office

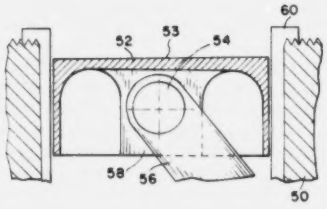
24

COMPOSITE MATERIALS

Includes laminates.

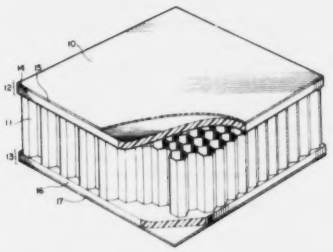
N85-28975*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LIGHTWEIGHT PISTON Patent Application
A. H. TAYLOR, inventor (to NASA) 2 May 1985 13 p
(NASA-CASE-LAR-13150-1; NAS 1.71:LAR-13150-1;
US-PATENT-APPL-SN-729767) Avail: NTIS HC A02/MF A01
CSCL 11D

A lightweight piston 12 composed of carbon-carbon composites is presented. The use of carbon-carbon composites over conventional materials, such as aluminum, reduces piston weight and improves thermal efficiency of the internal combustion reciprocation engine. Due to the negligible coefficient of thermal expansion and unique strength at elevated temperatures of carbon-carbon, the piston-to-cylinder wall 10 clearance is so small as to eliminate the necessity of piston rings. Use of the carbon-carbon composite piston has the effect of reducing the weight of other reciprocating engine components allowing the piston to run at higher speeds and improving specific engine performance. NASA



N85-28976*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
LIGHT WEIGHT FIRE RESISTANT GRAPHITE COMPOSITES Patent Application
D. A. KOURTIDES, J. A. PARKER, and M. T. S. HSU, inventors (to NASA) (HC Chem Research and Service Corp.) 28 Feb. 1985 36 p
(NASA-CASE-ARC-11615-1-SB; NAS 1.71:ARC-11615-1-SB;
US-PATENT-APPL-SN-706682) Avail: NTIS HC A03/MF A01
CSCL 11D

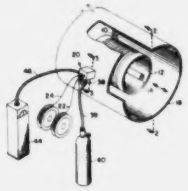
Composite structures with a honeycomb core and characterized by lightweight and excellent fire resistance are provided. These sandwich structures employ facesheets made up of bismaleimide-vinyl styrylpyridine copolymers with fiber reinforcement such as carbon fiber reinforcement. In preferred embodiments the facesheets are over-layered with a decorative film. The properties of these composites make them attractive materials of contruction for aircraft and spacecraft. NASA



N85-30027* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ARC SPRAY FABRICATION OF METAL MATRIX COMPOSITE MONOTAPE Patent
L. J. WESTFALL, inventor (to NASA) 21 May 1985 7 p Filed 9 Dec. 1983
(NASA-CASE-LEW-13828-1; US-PATENT-4,518,625;
US-PATENT-APPL-SN-560035; US-PATENT-CLASS-427-37;
US-PATENT-CLASS-219-76.14; US-PATENT-CLASS-427-178;
US-PATENT-CLASS-427-422) Avail: US Patent and Trademark Office CSCL 11D

Arc metal spraying is used to spray liquid metal onto an array of high strength fibers that were previously wound onto a large drum contained inside a controlled atmosphere chamber. This chamber is first evacuated to remove gaseous contaminants and then backfilled with a neutral gas up to atmospheric pressure. This process is used to produce a large size metal matrix composite monotape.

Official Gazette of the U.S. Patent and Trademark Office

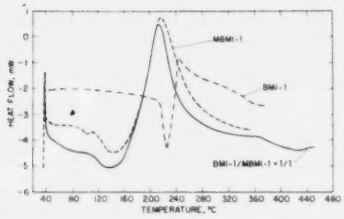


N85-30033*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
HIGH PERFORMANCE MIXED BISIMIDE RESINS AND COMPOSITES BASED THEREON Patent Application
J. A. PARKER, A. H. HEIMBUCH, M. T. S. HSU (HC Chem Research and Service Corp.), and T. S. CHEN, inventors (to NASA) (HC Chem Research and Service Corp.) 4 Apr. 1985 25 p

(NASA-CASE-ARC-11538-1-SB; NAS 1.71:ARC-11538-1-SB; US-PATENT-APPL-SN-719796) Avail: NTIS HC A02/MF A01 CSCL 11D

The invention relates to mixed bismaleimide/biscitraconimide resins. Mixtures of the two resins produces materials which have better handling, processing or mechanical and thermal properties, particularly in graphite composites, than materials made with the individual resins. The mechanical strength of cured graphite composites prepared from a 1:1 copolymer of such bisimide resins is excellent at both ambient and elevated temperatures. The copolymer mixture provides improved composites which are lighter than metals and replace metals in many aerospace applications.

NASA



N85-35233* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THERMAL BARRIER COATING SYSTEM Patent

S. STECURA, inventor (to NASA) 13 Aug. 1985 5 p Filed 14 Aug. 1984 Supersedes N84-33595 (22 - 23, p 3724) Continuation-in-part of US Patent-4,485,151, US Patent-Appl-SN-523297, filed 16 Aug. 1983, and continuation-in-part of abandoned US Patent-Appl-SN-375784, filed 6 May 1982

(NASA-CASE-LEW-14057-1; US-PATENT-4,535,033; US-PATENT-4,485,151; US-PATENT-APPL-SN-640712; US-PATENT-APPL-SN-523297; US-PATENT-APPL-SN-375784; US-PATENT-CLASS-428-633; US-PATENT-CLASS-428-656; US-PATENT-CLASS-428-678; US-PATENT-CLASS-428-679; US-PATENT-CLASS-428-680; US-PATENT-CLASS-428-681; US-PATENT-CLASS-428-682) Avail: US Patent and Trademark Office CSCL 11D

An oxide thermal barrier coating comprises ZrO3-Yb2O3 that is plasma sprayed onto a previously applied bond coating. The zirconia is partially stabilized with about 124 w/o ytterbia to insure cubic, monoclinic, and terragonal phases.

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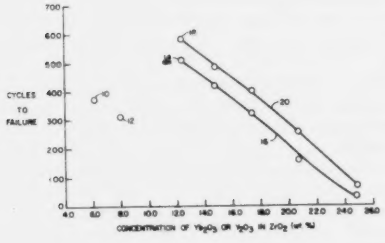


25

INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

N85-28982* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

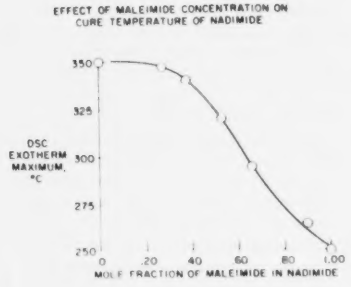
CHEMICAL CONTROL OF NADIMIDE CURE TEMPERATURE AND RATE Patent

R. W. LAUVER, inventor (to NASA) 30 Apr. 1985 9 p Filed 22 Jul. 1983 Division of US Patent Appl-SN-404809, filed 3 Aug. 1982, US Patent-4,455,418

(NASA-CASE-LEW-13770-2; US-PATENT-4,514,557; US-PATENT-4,455,418; US-PATENT-APPL-SN-516217; US-PATENT-APPL-SN-404809; US-PATENT-CLASS-528-342; US-PATENT-CLASS-526-262; US-PATENT-CLASS-528-322) Avail: US Patent and Trademark Office CSCL 07D

Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic end-capped reactant. This control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic-capped reactant.

Official Gazette of the U.S. Patent and Trademark Office


EFFECT OF MALEIMIDE CONCENTRATION ON CURE TEMPERATURE OF NADIMIDE
DSC EXOTHERM MAXIMUM, °C
MOLE FRACTION OF MALEIMIDE IN NADIMIDE

N85-30039* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE Patent

R. W. LAUVER, inventor (to NASA) 22 Jun. 1985 8 p Filed 14 Dec. 1983 Division of abandoned US Patent Appl-SN-516217, filed 22 Jul. 1983

(NASA-CASE-LEW-13770-6; US-PATENT-4,495,339; US-PATENT-APPL-SN-561434; US-PATENT-APPL-SN-516217; US-PATENT-CLASS-526-262; US-PATENT-CLASS-526-204; US-PATENT-CLASS-526-217; US-PATENT-CLASS-528-314; US-PATENT-CLASS-528-322) Avail: US Patent and Trademark Office CSCL 07D

Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl

end-capped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C. by controlling the available concentration of the maleic end-capped reactant. This control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, to increase Diels-Alder retrogression of the norbornenyl-capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic-capped reactant.

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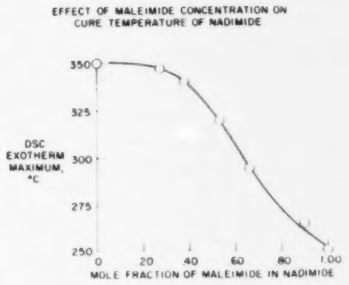

N85-35253* National Aeronautics and Space Administration. Pasadena Office, Calif.

FLUIDIZED BED DESULFURIZATION Patent

M. RAVINDRAM (JPL, Pasadena, Calif.) and J. J. KALLVINSKAS, inventors (to NASA) (JPL, Pasadena, Calif.) 16 Apr. 1985 16 p Filed 26 Aug. 1983 Supersedes N83-36122 (21 - 24, p 3923)
(NASA-CASE-NPO-15924-1; US-PATENT-4,511,362; US-PATENT-APPL-SN-526768; US-PATENT-CLASS-44-1-SR; US-PATENT-CLASS-201-17) Avail: US Patent and Trademark Office CSCL 07D

High sulfur content carbonaceous material, such as coal is desulfurized by continuous fluidized suspension in a reactor with chlorine gas, inert dechlorinating gas and hydrogen gas. A source of chlorine gas, a source of inert gas and a source of hydrogen gas are connected to the bottom inlet through a manifold and a heater. A flow controler operates servos in a manner to continuously and sequentially suspend coal in the three gases. The sulfur content is reduced at least 50% by the treatment.

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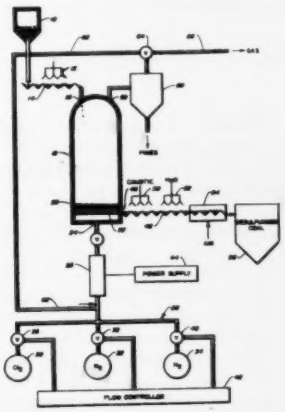

26

METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N85-29005* National Aeronautics and Space Administration. Pasadena Office, Calif.

CORROSION RESISTANT COATING Patent

S. K. KHANNA (JPL, Pasadena, Calif.), A. P. THAKOOR (JPL, Pasadena, Calif.), and R. M. WILLIAMS, inventors (to NASA) (JPL, Pasadena, Calif.) 11 Jun. 1985 8 p Filed 30 Sep. 1983 Sponsored by NASA
(NASA-CASE-NPO-15928-1; US-PATENT-4,522,844; US-PATENT-APPL-SN-537616; US-PATENT-CLASS-427-38; US-PATENT-CLASS-427-47; US-PATENT-CLASS-204-192N)
Avail: US Patent and Trademark Office CSCL 11F

A method of coating a substrate with an amorphous metal is described. A solid piece of the metal is bombarded with ions of an inert gas in the presence of a magnetic field to provide a vapor of the metal which is deposited on the substrate at a sufficiently low gas pressure so that there is formed on the substrate a thin, uniformly thick, essentially pinhole-free film of the metal.

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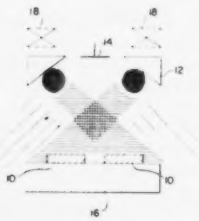

N85-35267* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

OXIDATION RESISTANT SLURRY COATING FOR CARBON-BASED MATERIALS Patent

J. L. SMIALEK and G. C. RYBICKI, inventors (to NASA) 13 Aug. 1985 6 p Filed 17 Jan. 1984 Supersedes N84-16266 (22 - 7, p 0967)
(NASA-CASE-LEW-13923-1; US-PATENT-4,535,035; US-PATENT-APPL-SN-571617; US-PATENT-CLASS-428-698; US-PATENT-CLASS-427-191; US-PATENT-CLASS-427-228; US-PATENT-CLASS-427-294; US-PATENT-CLASS-427-376.2; US-PATENT-CLASS-427-380; US-PATENT-CLASS-427-397.7; US-PATENT-CLASS-428-704) Avail: US Patent and Trademark Office CSCL 11F

An oxidation resistant coating is produced on carbon-base materials, and the same processing step effects an infiltration of the substrate with silicon containing material. The process comprises making a slurry of nickel and silicon powders in a nitrocellulose lacquer, spraying onto the graphite or carbon-carbon substrate, and sintering in vacuum to form a fused coating that wets and covers the surface as well as penetrates into the pores of the substrate. Optimum wetting and infiltration occurs in the range of Ni-60 w/o Si to Ni-90 w/o Si with deposited thicknesses of 25-100 mg/sq. cm. Sintering temperatures of about 1200 C to about 1400 C are used, depending on the melting point of the

specific coating composition. The sintered coating results in Ni-Si intermetallic phases and SiC, both of which are highly oxidation resistant.

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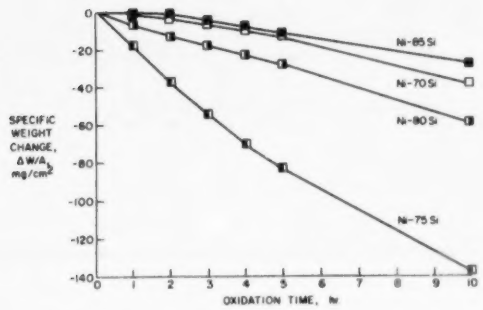


27

NONMETALLIC MATERIALS

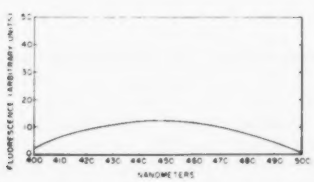
Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N85-29043* National Aeronautics and Space Administration. Pasadena Office, Calif.

STABILIZED UNSATURATED POLYESTERS Patent

O. VOGL (JPL, Pasadena, Calif.) and E. BORSIG, inventors (to NASA) (JPL, Pasadena, Calif.) 11 Jun. 1985 8 p Filed 6 Jun. 1984 Sponsored by NASA
(NASA-CASE-NPO-16103-1; US-PATENT-4,523,008; US-PATENT-APPL-SN-617871; US-PATENT-CLASS-528-288; US-PATENT-CLASS-525-26; US-PATENT-CLASS-525-47; US-PATENT-CLASS-526-328; US-PATENT-CLASS-526-329.2; US-PATENT-CLASS-528-289; US-PATENT-CLASS-528-303; US-PATENT-CLASS-528-304) Avail: US Patent and Trademark Office CSCL 11B

An unsaturated polyester, such as propylene glycolmaleic acid phthalic acid prepolymer dissolved in styrene is interpolymerized with an ultraviolet absorber and/or an antioxidant. The unsaturated chain may be filled with H or lower alkyl such as methyl and tertiary alkyl such as tertiary butyl. A polymer stable to exposure to the outdoors without degradation by ultraviolet radiation, thermal and/or photooxidation is formed. Author



N85-29044* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

DIFFUSELY REFLECTING PAINTS INCLUDING POLYTETRAFLUOROETHYLENE AND METHOD OF MANUFACTURE Patent

J. B. SCHUTT and M. C. SHAI, inventors (to NASA) 21 May 1985 6 p Filed 26 Apr. 1984
(NASA-CASE-GSC-12883-1; US-PATENT-4,518,722; US-PATENT-APPL-SN-604337; US-PATENT-CLASS-523-135; US-PATENT-CLASS-524-388; US-PATENT-CLASS-524-567)
Avail: US Patent and Trademark Office CSCL 11C

The invention pertains to a high diffuse, reflective paint comprising an alcohol soluble binder, polytetrafluoroethylene (TFE) and an alcohol for coating a substrate and forming an optical reference with a superior Lambertian characteristic. A method for making the paint by first mixing the biner and alcohol, and thereafter by mixing in outgassed TFE is described. A wetting agent may be employed to aid the mixing process.

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N85-34280* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

FIRE-RESISTANT PHOSPHORUS CONTAINING POLYIMIDES AND COPOLYIMIDES Patent

J. A. MIKROYANNIDIS, inventor (to NASA) (National Academy of Sciences - National Research Council, Washington, D.C.) 20 Aug. 1985 12 p Filed 16 Aug. 1984 Supersedes N85-21363 (23 - 12, p 1812) Continuation-in-part of US-Patent-Appl-SN-522629, 12 Aug. 1983
(NASA-CASE-ARC-11522-2; US-PATENT-4,536,565; US-PATENT-APPL-SN-641143; US-PATENT-CLASS-528-352; US-PATENT-CLASS-528-168; US-PATENT-CLASS-528-229; US-PATENT-CLASS-528-353) Avail: US Patent and Trademark Office CSCL 11C

Phosphorus-containing polyimides and copolyimides are synthesized in a two-step polycondensation reaction from 1-(diorganooxyphosphonl)methly 2,4- and 2,6-diaminobenzenes and tetracarboxylic anhydride. The diorgano position of the diorganooxyphosphonyl group includes alkyl, such as ethyl, substituted alkyl, such as 2-chloroethyl, and aryl such as phenyl. The tetracarboxylic anhydries include compounds such as pyrometallitic dianhydride and benzophenone tetracarboxylic dianhydride. The glass transition temperature (Tg) of the polyimides is reduced by incorporation of the (dialkoxyphosphonyl)methyl groups. The phosphorus-containing copolyimides show a considerably higher degree of fire-resistance as compared to that of the corresponding common polyimides.

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N85-34281* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

METAL (2) 4,4',4',4'' PHTHALOCYANINE TETRAAMINES AS CURING AGENTS FOR EPOXY RESINS Patent

B. N. ACHAR (National Academy of Sciences - National Research Council, Washington, D.C.), G. M. FOHLEN (National Academy of Sciences - National Research Council, Washington, D.C.), and J. A. PARKER, inventors (to NASA) (National Academy of Sciences - National Research Council, Washington, D.C.) 27 Aug. 1985 7 p Filed 11 Apr. 1984 Supersedes N85-21361 (23 - 12, p 1811) Continuation-in-part of US-Patent-4,499,260 US-Patent-Appl-SN-440656, 10 Nov. 1982
(NASA-CASE-ARC-11424-1; US-PATENT-4,537,834;

US-PATENT-APPL-SN-598777; US-PATENT-CLASS-428-413; US-PATENT-CLASS-428-260; US-PATENT-CLASS-428-408; US-PATENT-CLASS-525-107; US-PATENT-CLASS-525-113; US-PATENT-CLASS-525-229; US-PATENT-CLASS-525-119; US-PATENT-CLASS-525-186; US-PATENT-CLASS-528-94; US-PATENT-CLASS-528-113; US-PATENT-CLASS-528-117; US-PATENT-CLASS-528-407) Avail: US Patent and Trademark Office CSCL 11G

Metal, preferably divalent copper, cobalt or nickel, phthalocyanine tetraamines are used as curing agents for epoxides. The resulting copolymers have high thermal and chemical resistance and are homogeneous. They are useful as binders for laminates, e.g., graphite cloth laminate.

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N85-34282* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PROCESS FOR IMPROVING MOISTURE RESISTANCE OF EPOXY RESINS BY ADDITION OF CHROMIUM IONS Patent

A. K. ST.CLAIR, D. M. STOAKLEY, T. L. ST.CLAIR, and J. J. SINGH, inventors (to NASA) 9 Apr. 1985 7 p Filed 3 Nov. 1983 Supersedes N84-20700 (22 - 11, p 1636)
(NASA-CASE-LAR-13226-1; US-PATENT-4,510,277; US-PATENT-APPL-SN-548583; US-PATENT-CLASS-523-454; US-PATENT-CLASS-523-458; US-PATENT-CLASS-528-92; US-PATENT-CLASS-528-106; US-PATENT-CLASS-528-229; US-PATENT-CLASS-528-407) Avail: US Patent and Trademark Office CSCL 11G

A process for improving the moisture resistance properties of epoxidized TGMDA and DGEBA resin system by chemically incorporating chromium ions is described. The addition of chromium ions is believed to prevent the absorption of water molecules.

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31

ENGINEERING (GENERAL)

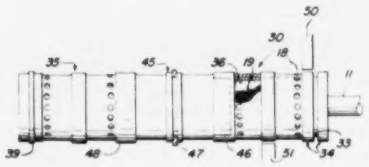
Includes vacuum technology; control engineering; display engineering; and cryogenics.

N85-29082* National Aeronautics and Space Administration. Pasadena Office, Calif.

RECIPROCATING MAGNETIC REFRIGERATOR EMPLOYING TANDEM POROUS MATRICES WITHIN A RECIPROCATING DISPLACER Patent

D. L. JOHNSON, inventor (to NASA) (JPL, Pasadena, Calif.) 2 Apr. 1985 13 p Filed 9 Mar. 1984 Sponsored by NASA
(NASA-CASE-NPO-16257-1; US-PATENT-4,507,928; US-PATENT-APPL-SN-588164; US-PATENT-CLASS-62-3) Avail: US Patent and Trademark Office CSCL 13A

Disclosed is a method and apparatus for a magnetic refrigeration system. A continuously reciprocating displacer houses at least a pair of paramagnetic substances each of which is alternately driven into and out of a magnetic field. Two separate bidirectional pumping systems flow helium gas through the displacer and through both paramagnetic substances to create heat exchange conditions at two separate temperature extremes. Author



N85-29083* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

INDUCTION HEATING GUN Patent

J. D. BUCKLEY, R. J. SWAIM, R. L. FOX, and D. F. JOHNSTON, inventors (to NASA) 4 Jun. 1985 9 p Filed 24 Jun. 1983 Sponsored by NASA
(NASA-CASE-LAR-13181-1; US-PATENT-4,521,659; US-PATENT-APPL-SN-507623; US-PATENT-CLASS-219-10.77; US-PATENT-CLASS-219-10.43; US-PATENT-CLASS-219-10.53; US-PATENT-CLASS-219-10.49; US-PATENT-CLASS-156-272.4; US-PATENT-CLASS-156-273.9; US-PATENT-CLASS-156-380.2) Avail: US Patent and Trademark Office CSCL 13H

A device for inductively heating and fusing thermoplastics is presented. It includes an alternating current passing through a tank circuit, the inductor member of the tank circuit is wrapped around a curved pole piece of a ferro-magnetic material. The magnetic flux arising within the inductor coil member flows to the ends of the pole piece and into a screen placed between the materials to be joined. The flux induces a current in the screen, and heat is generated to melt the thermoplastics together. Because only 30 to 150 watts of power are passed through the tank circuit, a wire which will remain cool under operational wattage may be selected, making air or fluid cooling unnecessary.

Official Gazette of the U.S. Patent and Trademark Office

N85-29084*# National Aeronautics and Space Administration. Pasadena Office, Calif.

TEN DEGREE KELVIN HYDRIDE REFRIGERATOR Patent Application

J. A. JONES, inventor (to NASA) (JPL, Pasadena, Calif.) 14 Feb. 1985 14 p

(Contract NAS7-918)
(NASA-CASE-NPO-16393-1-CU; NAS 1.71:NPO-16393-1-CU; US-PATENT-APPL-SN-701486) Avail: NTIS HC A02/MF A01 CSCL 13I

A compact hydride absorption refrigeration system with few moving parts for 10 Kelvin operation is disclosed and comprises liquid hydrogen producing means in combination with means for solidifying and subliming the liquid hydrogen produced. The liquid hydrogen is sublimed at about 10 Kelvin. By using a symmetrical all hydrogen redundant loop system, a 10 Kelvin refrigeration system can be operated for many years with only a fraction of the power required for prior art systems. Author

32

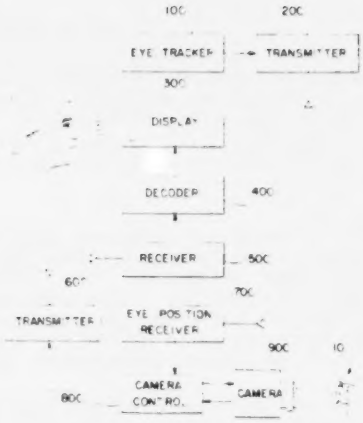
COMMUNICATIONS

Includes land and global communications; communications theory; and optical communications.

N85-29117* National Aeronautics and Space Administration. Pasadena Office, Calif.
RETINALLY STABILIZED DIFFERENTIAL RESOLUTION TELEVISION DISPLAY Patent
C. F. RUOFF, JR., inventor (to NASA) (JPL, Pasadena, Calif.) 23 Apr. 1985 11 p Filed 28 Sep. 1982 Sponsored by NASA (NASA-CASE-NPO-15432-1; US-PATENT-4,513,317; US-PATENT-APPL-SN-425204; US-PATENT-CLASS-358-133; US-PATENT-CLASS-358-109) Avail: US Patent and Trademark Office CSCL 17B

A remote television viewing system employing an eye tracker is disclosed, wherein a small region of the image appears in high resolution, and the remainder of the image appears in low resolution. The eye tracker monitors the position of the viewer's line of sight. The eye tracker position data is transmitted to the remote television camera and control. Both the remote camera and television display are adapted to have selectable high-resolution and low resolution raster scan modes. The position data from the eye tracker is used to determine the point at which the high-resolution scan is to commence. The video data defining the observed image is encoded in a novel format, wherein in each data field, the data representing the position of the high resolution region of predetermined size appears first, followed by the high resolution zone video data and then the low-resolution region data. As the viewer's line of sight relative to the displayed image changes, the position of the high resolution region changes to track the viewer's line of sight.

Official Gazette of the U.S. Patent and Trademark Office



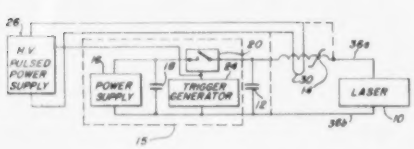
N85-29118* National Aeronautics and Space Administration. Pasadena Office, Calif.
BEAM FORMING NETWORK Patent
P. W. CRAMER, JR., inventor (to NASA) (JPL, Pasadena, Calif.) 5 Mar. 1985 12 p Filed 10 Dec. 1982 Sponsored by NASA (NASA-CASE-NPO-15743-1; US-PATENT-4,503,436; US-PATENT-APPL-SN-448881; US-PATENT-CLASS-343-876; US-PATENT-CLASS-455-73) Avail: US Patent and Trademark Office CSCL 20N

The network, which is connected to a layer of 134 feed elements that transmit and receive microwaves, consists of a pair of circuit boards parallel to the feed element layer. One of the two boards has 87 dividers that each divide a signal to be transmitted into seven portions, and the other board has 134 combiners that each collect seven transmit signal portions and deliver the sum to one of the feed elements. A similar arrangement is used to handle received signals. The large number of interconnections are made by printed circuit conductors radiating from each of the numerous dividers and combiners, and by providing interconnection pins that interconnect the ends of pairs of conductors lying on the two boards. The printed circuit conductors extend in undulating paths

that provide maximum separation of conductors to minimize crosstalk. Author

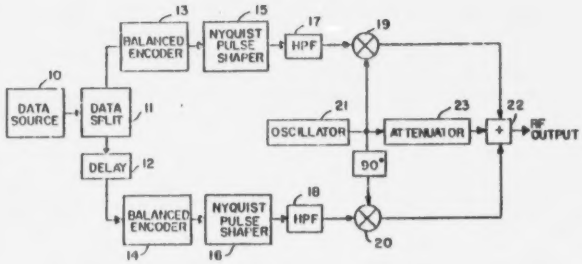
N85-29120*# National Aeronautics and Space Administration. Kennedy (John F.) Space Center, Cocoa Beach, Fla.
A METHOD AND APPARATUS FOR OPERATING ON COMPANDED PCM VOICE DATA Patent Application
F. BYRNE, inventor (to NASA) 28 Sep. 1984 15 p
(NASA-CASE-KSC-11285-1; NAS 1.71:KSC-11285-1; US-PATENT-APPL-SN-655601) Avail: NTIS HC A02/MF A01 CSCL 17B

A method and apparatus for digitizing audio signals being generated from plurality of parties in order to provide audio communication between the parties with a minimum of interference. Audio signals are converted to a pulse code modulator companded signal for transmitting to a remote location and then converting each of the companded signals to a first eight parallel signal. Each of the eight bit parallel signals from the individual parties are fed to a read-only memory (ROM) causing the ROM to produce an eight bit signal on the output representing the instantaneous sum of the eight bit parallel signals being supplied to the imputs thereof. The eight bit parallel signal appearing on the output of the ROM is converted to a serial digital by a parallel to serial converter (50) for transmitting over a single line (52) to another serial to parallel coverter (54) prior to being fed through a digital to analog converter to the receiver (58) for producing the audio signal at the receiver. NASA



N85-29121*# National Aeronautics and Space Administration. Pasadena Office, Calif.
TONE CALIBRATED DIGITAL RADIO COMMUNICATION SYSTEM Patent Application
F. DAVARIAN, inventor (to NASA) (JPL, Pasadena, Calif.) 2 May 1985 23 p
(Contract NAS7-918)
(NASA-CASE-NPO-16414-1-CU; NAS 1.71:NPO-16414-1-CU; US-PATENT-APPL-SN-727719) Avail: NTIS HC A02/MF A01 CSCL 17B

A transmitter for digital radio communication creates a null by balanced encoding of data modulated on an RF carrier, and inserts a calibration tone within the null. It is accomplished by having the calibration tone coincide in phase and frequency with the transmitted radio frequency output, for coherent demodulation of data at the receiver where the tone calibration signal is extracted and used for multipath fading compensation. Author

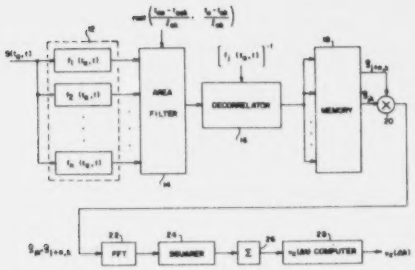


N85-34327* National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR DELTA KAPPA SYNTHETIC APERTURE RADAR MEASUREMENT OF OCEAN CURRENT Patent
A. JAIN, inventor (to NASA) (JPL, Pasadena, Calif.) 2 Apr. 1985 8 p Filed 18 Mar. 1982 Supersedes N82-28502 (20 - 19, p 2673)
(NASA-CASE-NPO-15704-1; US-PATENT-4,509,048; US-PATENT-APPL-SN-359382; US-PATENT-CLASS-343-5-CM; US-PATENT-CLASS-343-5-W; US-PATENT-CLASS-343-17.2-PC) Avail: US Patent and Trademark Office CSCL 17I

A synthetic aperture radar (SAR) employed for delta k measurement of ocean current from a spacecraft without the need for a narrow beam and long observation times. The SAR signal is compressed to provide image data for different sections of the chirp band width, equivalent to frequencies and a common area for the separate image fields is selected. The image for the selected area at each frequency is deconvolved to obtain the image signals for the different frequencies and the same area. A product of pairs of signals is formed, Fourier transformed and squared. The spectrum thus obtained from different areas for the same pair of frequencies are added to provide an improved signal to noise ratio. The shift of the peak from the center of the spectrum is measured and compared to the expected shift due to the phase

velocity of the Bragg scattering wave. Any difference is a measure of current velocity v sub o (delta k).

Official Gazette of the U.S. Patent and Trademark Office



33

ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

N85-22877* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

POWER CONTROL FOR AC MOTOR Patent

R. W. DABNEY, inventor (to NASA) 18 Dec. 1984 8 p Filed 14 Jun. 1983 Supersedes N83-28329 (21 - 17, p 2743)
(NASA-CASE-MFS-25861-1; NAS 1.71:MFS-25861-1; US-PATENT-4,489,264; US-PATENT-APPL-SN-504345; US-PATENT-CLASS-318-729; US-PATENT-CLASS-318-812)
Avail: US Patent and Trademark Office CSCL 09A

A motor controller employing a triac through which power is supplied to a motor is described. The open circuit voltage appearing across the triac controls the operation of a timing circuit. This timing circuit triggers on the triac at a time following turn off which varies inversely as a function of the amplitude of the open circuit voltage of the triac.

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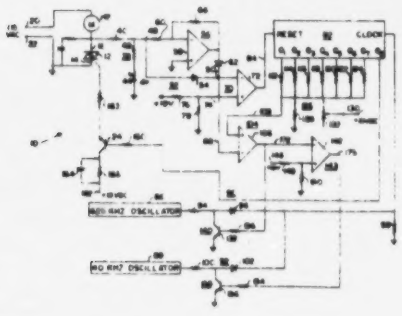

N85-29142* National Aeronautics and Space Administration. Pasadena Office, Calif.

CLOSED LOOP ELECTROSTATIC LEVITATION SYSTEM Patent

W. K. RHIM (JPL, Pasadena, Calif.), M. M. SAFFREN (JPL, Pasadena, Calif.), and D. D. ELLEMAN, inventors (to NASA) (JPL, Pasadena, Calif.) 4 Jun. 1985 8 p Filed 29 Oct. 1982 Sponsored by NASA
(NASA-CASE-NPO-15553-1; US-PATENT-4,521,854; US-PATENT-APPL-SN-437912; US-PATENT-CLASS-364-400; US-PATENT-CLASS-74-5.6D; US-PATENT-CLASS-156-DIG.62; US-PATENT-CLASS-364-453) Avail: US Patent and Trademark Office CSCL 09C

An electrostatic levitation system is described, which can closely control the position of objects of appreciable size. A plurality of electrodes surround the desired position of an electrostatically charged object, the position of the objects is monitored, and the voltages applied to the electrodes are varied to hold the object at a desired position. In one system, the object is suspended above a plate-like electrode which has a concave upper face to urge the object toward the vertical axis of the curved plate. An upper electrode that is also curved can be positioned above the object, to assure curvature of the field at any height above the lower plate. In another system, four spherical electrodes are positioned at the points of a tetrahedron, and the voltages applied to the electrodes are varied in accordance with the object position as detected by two sensors.

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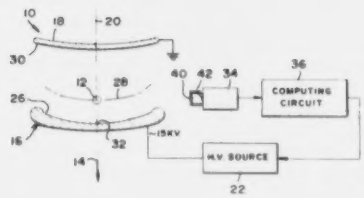


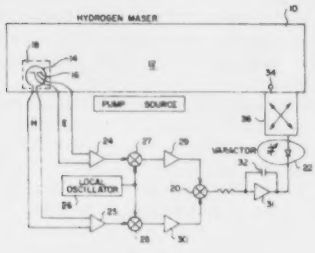
N85-29143* National Aeronautics and Space Administration. Pasadena Office, Calif.

MASER CAVITY SERVO-TUNING SYSTEM Patent

R. L. SYDNOR, inventor (to NASA) (JPL, Pasadena, Calif.) 14 May 1985 8 p Filed 30 Nov. 1983 Sponsored by NASA
(NASA-CASE-NPO-15890-1-CU; US-PATENT-4,517,530; US-PATENT-APPL-SN-556513; US-PATENT-CLASS-331-3; US-PATENT-CLASS-331-31; US-PATENT-CLASS-331-36C; US-PATENT-CLASS-331-96; US-PATENT-CLASS-331-94.1; US-PATENT-CLASS-333-231) Avail: US Patent and Trademark Office CSCL 10A

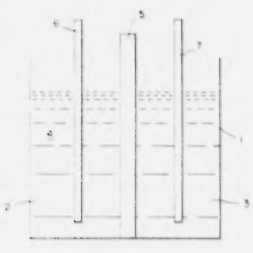
Two collocated, weakly coupled probes, one loop and one dipole, detect the magnetic and electric fields inside a maser cavity. Signals from the probes are compared in phase, and the signal output from the phase detector is applied to a varactor, the reactance of which is coupled into the cavity by a microwave coupler. Alternatively, the varactor may be placed inside the cavity. Any deviation of phase from 90 deg as detected by the phase detector will then produce an error signal that will change the reactance coupled into the resonant cavity to change its reactance, and thus correct its resonance frequency. An alternative to using

two probes is to use a single disk probe oriented to detect both the magnetic and electric fields, and thus provide the error signal directly. Author



N85-29144* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ALKALINE BATTERY CONTAINING A SEPARATOR OF A CROSS-LINKED COPOLYMER OF VINYL ALCOHOL AND UNSATURATED CARBOXYLIC ACID Patent
L. C. HSU, W. H. PHILIPP, D. W. SHEIBLEY, and O. D. GONZALEZ-SANABRIA, inventors (to NASA) 19 Mar. 1985 6 p Filed 10 Jul. 1981
(NASA-CASE-LEW-13102-1; US-PATENT-4,505,998; US-PATENT-APPL-SN-282298; US-PATENT-CLASS-429-206; US-PATENT-CLASS-429-249) Avail: US Patent and Trademark Office CSCL 10C

A battery separator for an alkaline battery is described. The separator comprises a cross linked copolymer of vinyl alcohol units and unsaturated carboxylic acid units. The cross linked copolymer is insoluble in water, has excellent zincate diffusion and oxygen gas barrier properties and a low electrical resistivity. Cross linking with a polyaldehyde cross linking agent is preferred.
Official Gazette of the U.S. Patent and Trademark Office



N85-29145* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
REACTANCELESS SYNTHESIZED IMPEDANCE BANDPASS AMPLIFIER Patent
L. L. KLEINBERG, inventor (to NASA) 4 Jun. 1985 8 p Filed 13 Oct. 1982
(NASA-CASE-GSC-12788-1; US-PATENT-4,521,702; US-PATENT-APPL-SN-434085; US-PATENT-CLASS-307-520; US-PATENT-CLASS-307-271; US-PATENT-CLASS-307-521; US-PATENT-CLASS-307-529; US-PATENT-CLASS-328-167; US-PATENT-CLASS-330-302; US-PATENT-CLASS-330-306) Avail: US Patent and Trademark Office CSCL 09A

An active R bandpass filter network is formed by four operational amplifier stages interconnected by discrete resistances. One pair of stages synthesize an equivalent input impedance of an inductance (L sub eq) in parallel with a discrete resistance (R sub o) while the second pair of stages synthesizes an equivalent input impedance of a capacitance (C sub eq) serially coupled to another discrete resistance (R sub i) coupled in parallel with the first two stages. The equivalent input impedances aggregately define a tuned resonant bandpass filter in the roll-off regions of the operational amplifiers.
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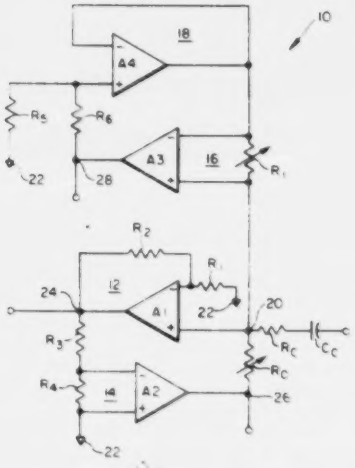
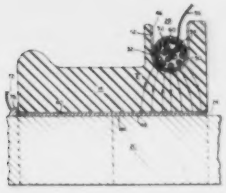


N85-29146* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HIGH VOLTAGE ISOLATION TRANSFORMER Patent
C. H. CLATTERBUCK and A. P. RUITBERG, inventors (to NASA) 9 Apr. 1985 8 p Filed 21 Jun. 1983
(NASA-CASE-GSC-12817-1; US-PATENT-4,510,476; US-PATENT-APPL-SN-506477; US-PATENT-CLASS-336-84C; US-PATENT-CLASS-336-198) Avail: US Patent and Trademark Office CSCL 10A

A high voltage isolation transformer is provided with primary and secondary coils separated by discrete electrostatic shields from the surfaces of insulating spools on which the coils are wound. The electrostatic shields are formed by coatings of a compound with a low electrical conductivity which completely encase the coils and adhere to the surfaces of the insulating spools adjacent to the coils. Coatings of the compound also line axial bores of the spools, thereby forming electrostatic shields separating the spools from legs of a ferromagnetic core extending through the

bores. The transformer is able to isolate a high constant potential applied to one of its coils, without the occurrence of sparking or corona, by coupling the coatings, lining the axial bores to the ferromagnetic core and by coupling one terminal of each coil to the respective coating encasing the coil.

Official Gazette of the U.S. Patent and Trademark Office



N85-29147* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

HIGH VOLTAGE POWER SUPPLY Patent

A. P. RUITBERG and K. M. YOUNG, inventors (to NASA) 14 May 1985 16 p Filed 6 Jul. 1983

(NASA-CASE-GSC-12818-1; US-PATENT-4,517,472; US-PATENT-APPL-SN-511362; US-PATENT-CLASS-307-82; US-PATENT-CLASS-363-19; US-PATENT-CLASS-363-23; US-PATENT-CLASS-363-61; US-PATENT-CLASS-363-100; US-PATENT-CLASS-363-71; US-PATENT-CLASS-378-104; US-PATENT-CLASS-378-112) Avail: US Patent and Trademark Office CSCL 10B

A high voltage power supply is formed by three discrete circuits energized by a battery to provide a plurality of concurrent output signals floating at a high output voltage on the order of several tens of kilovolts. In the first two circuits, the regulator stages are pulse width modulated and include adjustable ressistances for varying the duty cycles of pulse trains provided to corresponding oscillator stages while the third regulator stage includes an adjustable resistance for varying the amplitude of a steady signal provided to a third oscillator stage. In the first circuit, the oscillator, formed by a constant current drive network and a tuned resonant network included a step up transformer, is coupled to a second step up transformer which, in turn, supplies an amplified sinusoidal signal to a parallel pair of complementary poled rectifying, voltage multiplier stages to generate the high output voltage.

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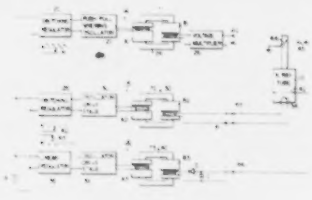


N85-29149*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

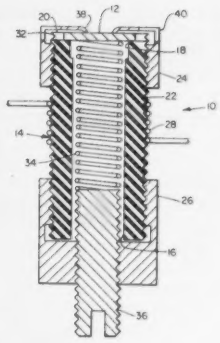
APPARATUS FOR MOUNTING A FIELD EMISSION CATHODE Patent Application

B. T. EBIHARA and R. FORMAN, inventors (to NASA) 9 May 1985 9 p

(NASA-CASE-LEW-14108-1; NAS 1.71:LEW-14108-1; US-PATENT-APPL-SN-732321) Avail: NTIS HC A02/MF A01 CSCL 09A

A field emission cathode is positioned in a pair of intersecting cross grooves, in the end of a ceramic tube by a metal end cap. A spring in electrical contact with the base of the cathode provides the necessary pressure to maintain continuous circumferential electrical contact between the gate film and a raised edge on the end cap. With this structure the cathode chip is self centering and easily replaceable. Also the gate film of the cathode is not abraded or rubbed during installation, and the holder is readily degassed.

Author



N85-29150*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

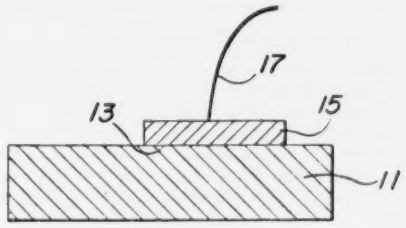
ELECTRO-EXPULSIVE SEPARATION SYSTEM Patent Application

L. A. HASLIM and R. D. LEE, inventors (to NASA) 31 May 1985 51 p

(NASA-CASE-ARC-11613-1; NAS 1.71:ARC-11613-1; US-PATENT-APPL-SN-739792) Avail: NTIS HC A04/MF A01 CSCL 09A

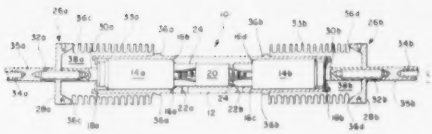
An electro-expulsive system has one or more overlapped conductors, each comprising a flexible ribbon conductor, which is folded back on itself. The conductors are embedded in an elastomeric material. Large current pulses are fed to the conductors from power storage units. As a result of the antiparallel currents, the opposed segments of a conductor are forcefully separated and the elastomeric material is distended. Void in the elastomer aid the separation of the conductor segments. The distention is

almost instantaneous when a current pulse reaches the conductor and the distention tends to remove any solid body on the surface of the elastomeric material. NASA



N85-29151*# National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD FOR ULTRASONIC BONDING TO SOFT MICROELECTRONIC SUBSTRATES Patent Application
B. L. CONROY (JPL, Pasadena, Calif.) and C. T. CRUZAN (JPL, Pasadena, Calif.) 22 Apr. 1985 7 p
(Contract NAS 7-100)
(NASA-CASE-NPO-16087-1; NAS 1.71:NPO-16087-1; US-PATENT-APPL-SN-725726) Avail: NTIS HC A02/MF A01 CSCL 09C

A method of ultrasonically bonding electrical leads to soft microelectronic substrates such as those which are Teflon-based is discussed. According to the inventive method, an interconnecting element such as a gold-plated copper disc is soldered to the substrate, and an electrical lead thereafter ultrasonically bonded to the interconnecting element. In contrast to the soft substrate, the interconnecting element does not dissipate ultrasonic energy and permits an ultrasonic bond to be formed between the electrical lead and interconnecting elements. NASA



N85-30187* National Aeronautics and Space Administration. Pasadena Office, Calif.
SPLIT-CROSS-BRIDGE RESISTOR FOR TESTING FOR PROPER FABRICATION OF INTEGRATED CIRCUITS Patent
M. G. BUEHLER, inventor (to NASA) (JPL, Pasadena, Calif.) 7 May 1985 15 p Filed 26 Jul. 1982 Sponsored by NASA
(NASA-CASE-NPO-16021-1; US-PATENT-4,516,071; US-PATENT-APPL-SN-402205; US-PATENT-CLASS-324-158R; US-PATENT-CLASS-324-65R) Avail: US Patent and Trademark Office CSCL 10A

An electrical testing structure and method is described whereby a test structure is fabricated on a large scale integrated circuit wafer along with the circuit components and has a van der Pauw cross resistor in conjunction with a bridge resistor and a split bridge resistor, the latter having two channels each a line width wide, corresponding to the line width of the wafer circuit components, and with the two channels separated by a space equal to the line spacing of the wafer circuit components. The testing structure has associated voltage and current contact pads arranged in a two by four array for conveniently passing currents through the test structure and measuring voltages at appropriate points to calculate the sheet resistance, line width, line spacing, and line pitch of the circuit components on the wafer electrically.
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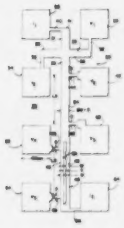
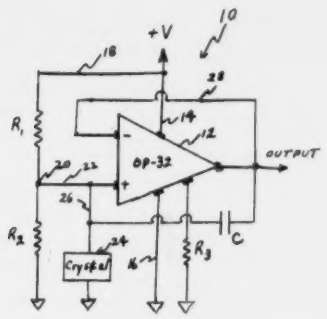


N85-30201*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TEMPERATURE SENSITIVE OSCILLATOR Patent Application
L. L. KLEINBERG, inventor (to NASA) 25 Apr. 1985 14 p
(NASA-CASE-GSC-12958-1; NAS 1.71:GSC-12958-1; US-PATENT-APPL-SN-727035) Avail: NTIS HC A02/MF A01 CSCL 09A

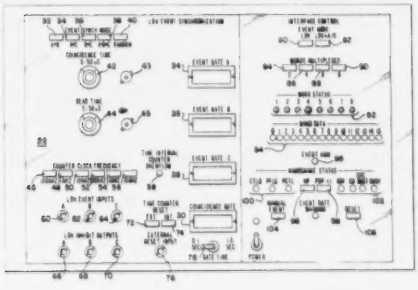
An oscillator circuit for sensing and indicating temperature by changing oscillator frequency with temperature comprises a programmable operational amplifier which is operated on the roll-off portion of its gain versus frequency curve and has its output directly connected to the inverting input to place the amplifier in a follower configuration. Its output is also connected to the non-inverting input by a capacitor with a crystal or other tuned circuit also being connected to the non-inverting input. A resistor is connected to the program input of the amplifier to produce a given set current at a given temperature, the set current varying with temperature. As the set current changes, the gain-bandwidth of the amplifier changes and, in turn, the reflected capacitance across the crystal changes, thereby providing the desired change in oscillator frequency by pulling the crystal. There is no requirement that a

crystal employed with this circuit display either a linear frequency change with temperature or a substantial frequency change with temperature. Author



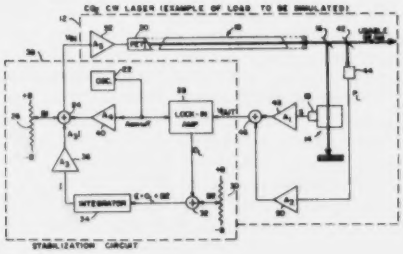
N85-30202*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
LDV MULTIPLEXER INTERFACE Patent Application
D. R. HARRISON and J. L. BROWN, inventors (to NASA) 22 Apr. 1985 46 p
(NASA-CASE-ARC-11536-1; NAS 1.71:ARC-11536-1; US-PATENT-APPL-SN-725714) Avail: NTIS HC A03/MF A01 CSCL 09A

A laser Doppler velocimeter multiplexer interface includes an event pulse synchronizer which synchronizes data pulses from events A, B and C. Clock control is connected to receive timing information on the data pulses from the synchronizer. Displays are connected to receive clock signals from the clock control for indicating a data rate for each of the measured events A, B and C. The display is connected to receive clock signals from the clock control to indicate a coincidence rate between data pulses for any selected combination of the measured events A, B and C. A multiplexer receives the data pulses from the events A, B and C and rate data from the clock control. The multiplexer has output for supplying the data pulses and rate data to a single input of a data processing system. A multiplexer control is connected to supply control signals to the multiplexer for selecting the event data pulses and the rate data for output from the multiplexer. R.J.F.



N85-34333* National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR TRANSFER FUNCTION SIMULATOR FOR TESTING COMPLEX SYSTEMS Patent
M. J. KAVAYA, inventor (to NASA) (JPL, Pasadena, Calif.) 2 Apr. 1985 13 p Filed 11 Jun. 1982 Supersedes N82-28619 (20 - 19, p 2690)
(NASA-CASE-NPO-15696-1; US-PATENT-4,509,132; US-PATENT-APPL-SN-387647; US-PATENT-CLASS-364-571; US-PATENT-CLASS-364-578; US-PATENT-CLASS-372-32)
Avail: US Patent and Trademark Office CSCL 09C

A method and apparatus for testing the operation of a complex stabilization circuit in a closed loop system is presented. The method is comprised of a programmed analog or digital computing system for implementing the transfer function of a load thereby providing a predictable load. The digital computing system employs a table stored in a microprocessor in which precomputed values of the load transfer function are stored for values of input signal from the stabilization circuit over the range of interest. This technique may be used not only for isolating faults in the stabilization circuit, but also for analyzing a fault in a faulty load by so varying parameters of the computing system as to simulate operation of the actual load with the fault.
Official Gazette of the U.S. Patent and Trademark Office



34

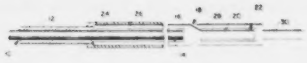
FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

N85-29179* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH THERMAL POWER DENSITY HEAT TRANSFER APPARATUS PROVIDING ELECTRICAL ISOLATION AT HIGH TEMPERATURE USING HEAT PIPES Patent
J. F. MORRIS, inventor (to NASA) 19 Mar. 1985 6 p Filed 24 Jun. 1983 Continuation-in-part of abandoned US Patent Appl-SN-202228, filed 30 Nov. 1980
(NASA-CASE-LEW-12950-2; US-PATENT-4,506,183; US-PATENT-APPL-SN-507626; US-PATENT-APPL-SN-202228; US-PATENT-CLASS-310-306; US-PATENT-CLASS-165-32; US-PATENT-CLASS-165-104.14) Avail: US Patent and Trademark Office CSCL 20D

This invention is directed to transferring heat from an extremely high temperature source to an electrically isolated lower temperature receiver. The invention is particularly concerned with supplying thermal power to a thermionic converter from a nuclear

reactor with electric isolation. Heat from a high temperature heat pipe is transferred through a vacuum or a gap filled with electrically nonconducting gas to a cooler heat pipe. If the receiver requires gratr thermal power density, geometries are used with larger heat pipe areas for transmitting and receiving energy than the area for conducting the heat to the thermionic converter. In this way the heat pipe capability for increasing thermal power densities compensates for the comparative low thermal power densities through the electrically nonconducting gap between the two heat pipes. Official Gazette of the U.S. Patent and Trademark Office



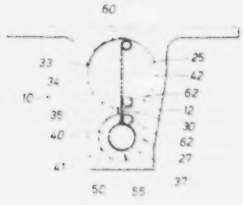
N85-29180* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,

MONOGROOVE HEAT PIPE DESIGN: INSULATED LIQUID CHANNEL WITH BRIDGING WICK Patent

J. P. ALARIO, R. F. BROWN, and R. L. KOSSON, inventors (to NASA) 7 May 1985 8 p Filed 30 May 1984 Sponsored by NASA

(NASA-CASE-MSC-20497-1; US-PATENT-4,515,207; US-PATENT-APPL-SN-615505; US-PATENT-CLASS-165-1; US-PATENT-CLASS-122-366; US-PATENT-CLASS-165-104.26) Avail: US Patent and Trademark Office CSCL 20D

A screen mesh artery supported concentrically within the evaporator section of a heat pipe liquid channel retains liquid in the channel. Continued and uniform liquid feed to the heat pipe evaporation section (20) during periods of excessive heat transfer is assured. The overall design provides high evaporation and condensation film coefficients for the working fluid by means of the circumferential grooves in the walls of the vapor channel, while not interfering with the overall heat transport capability of the axial groove. The design has particular utility in zero-g environments. Author



N85-29182*# National Aeronautics and Space Administration. Pasadena Office, Calif.

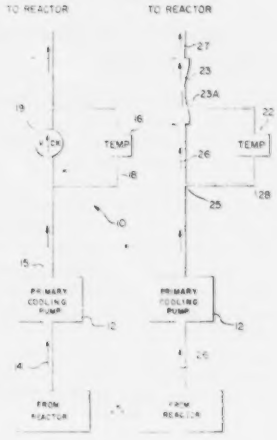
JET PUMP-DRIVE SYSTEM FOR HEAT REMOVAL Patent Application

J. R. FRENCH, inventor (to NASA) (JPL, Pasadena, Calif.) 31 May 1985 10 p

(Contract NAS7-918)

(NASA-CASE-NPO-16494-1-CU; NAS 1.71:NPO-16494-1-CU; US-PATENT-APPL-SN-739789) Avail: NTIS HC A02/MF A01 CSCL 20D

A jet pump, in combination with a TEMP, is employed to assure safe cooling of a nuclear reactor after shutdown. A TEMP, responsive to the heat from the coolant in the secondary flow path, automatically pumps the withdrawn coolant to a higher pressure and thus higher velocity compared to the main flow. The high velocity coolant is applied as a driver flow for the jet pump which has a main flow chamber located in the main flow circulation pump. Upon nuclear shutdown and loss of power for the main reactor pumping system, the TEMP/jet pump combination continues to boost the coolant flow in the direction it is already circulating. During the decay time for the nuclear reactor, the jet pump keeps running until the coolant temperature drops to a lower and safe temperature. At this lower temperature, the TEMP/jet jump combination ceases its circulation boosting operation. The TEMP/jet pump combination is automatic, self-regulating and provides an emergency pumping system free of moving parts. Author



N85-33433* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

VORTEX GENERATING FLOW PASSAGE DESIGN FOR INCREASED FILM COOLING EFFECTIVENESS Patent

S. S. PAPELL, inventor (to NASA) 16 Jul. 1985 8 p Filed 15 Feb. 1984 Supersedes N84-20782 (22 - 11, p 1652)

(NASA-CASE-LEW-14039-1; US-PATENT-4,529,358; US-PATENT-APPL-SN-580419; US-PATENT-CLASS-416-97A; US-PATENT-CLASS-415-115) Avail: US Patent and Trademark Office CSCL 20D

It is an object of the invention to provide a film cooling apparatus of increased effectiveness and efficiency. In accordance with the invention, a cooling fluid is injected into a hot flowing gas through a passageway in a wall which contains and is subject to the hot

gas. The passageway is slanted in a downstream direction at an acute angle to the wall. A cusp shape is provided in the passageway to generate vortices in the injected cooling fluid thereby reducing the energy extracted from the hot gas for that purpose. The cusp shape increases both film cooling effectiveness and wall area coverage. The cusp may be at either the downstream or upstream side of the passageway, the former substantially eliminating flow separation of the cooling fluid from the wall immediately downstream of the passageway.

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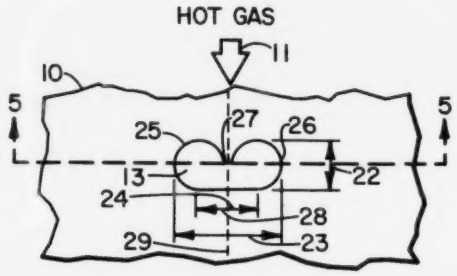

35

INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

N85-29212* National Aeronautics and Space Administration. Pasadena Office, Calif.

TRACE WATER SENSOR Patent

J. B. STEPHENS (JPL, Pasadena, Calif.), M. M. YANG (JPL, Pasadena, Calif.), and E. G. LAUE, inventors (to NASA) (JPL, Pasadena, Calif.) 30 Apr. 1985 6 p Filed 14 Jan. 1983 Sponsored by NASA

(NASA-CASE-NPO-15722-1; US-PATENT-4,514,178; US-PATENT-APPL-SN-457992; US-PATENT-CLASS-204-430; US-PATENT-CLASS-204-1T; US-PATENT-CLASS-73-336.5)

Avail: US Patent and Trademark Office CSCL 14B

A solid electrolytic type hygrometer is described, which operates with high reliability while providing rapid and sensitive response. A gold foil electrode is wrapped about a hollow glass cylinder, a sheet of hydroscopic-electrolytic material is wrapped about the foil, and a wire is wound around the outside of the electrolytic sheet. Moisture passing between wire turns can be absorbed by the electrolytic material, and then dissociated by current passed by the electrodes through the electrolytic material. The cylinder has a slit extending along its length, to allow resilient expansion to press the sheet of electrolytic material firmly against the electrodes. The wire turns lie against one another to cause rapid dissociation of moisture throughout the electrolytic material. Additional guard wires lie at opposite ends of the electrolytic sheet, and currents pass through them to avoid moisture buildup at the ends of the main wire coil.

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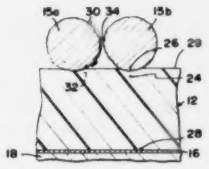

N85-29213* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,

MOISTURE CONTENT AND GAS SAMPLING DEVICE Patent

H. C. KRIEG, JR., inventor (to NASA) (TRW, Inc., Redondo Beach, Calif.) 7 May 1985 14 p Filed 19 Feb. 1982 Sponsored by NASA

(NASA-CASE-MSC-18866-1; US-PATENT-4,515,751; US-PATENT-APPL-SN-350471; US-PATENT-CLASS-422-86; US-PATENT-CLASS-422-103; US-PATENT-CLASS-422-88; US-PATENT-CLASS-436-2; US-PATENT-CLASS-73-40.7; US-PATENT-CLASS-73-863.86; US-PATENT-CLASS-73-864.52)

Avail: US Patent and Trademark Office CSCL 14B

An apparatus is described for measuring minute quantities of moisture and other contaminants within sealed enclosures such as electronic assemblies which may be subject to large external atmospheric pressure variations. An array of vacuum quality valves is arranged to permit cleansing of the test apparatus of residual atmospheric components from a vacuum source. This purging operation evacuates a gas sample bottle, which is then connected by valve settings to provide the drive for withdrawing a gas sample from the sealed enclosure under test into the sample bottle through a colometric detector tube (Drager tube) which indicates moisture content. The sample bottle may be disconnected and its contents (drawn from the test enclosure) separately subjected to mass spectrograph analysis.

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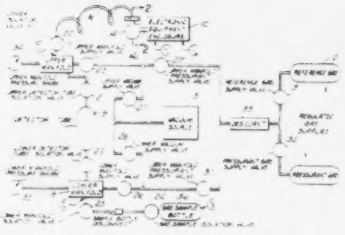
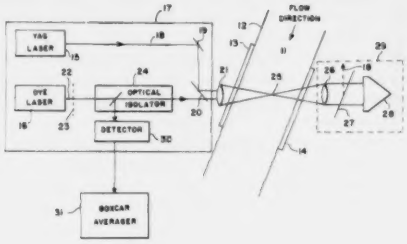


N85-29214* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,
LOW GRAVITY EXOTHERMIC HEATING/COOLING APPARATUS Patent
R. M. POORMAN, inventor (to NASA) 30 Apr. 1985 7 p
Filed 18 Mar. 1982 Sponsored by NASA
(NASA-CASE-MSC-25707-1; US-PATENT-4,513,810;
US-PATENT-APPL-SN-359627; US-PATENT-CLASS-165-61;
US-PATENT-CLASS-126-263; US-PATENT-CLASS-244-163;
US-PATENT-CLASS-165-64; US-PATENT-CLASS-165-48R)
Avail: US Patent and Trademark Office CSCL 14B

A low gravity exothermic heating/cooling apparatus is disclosed for processing materials in space which includes an insulated casing and a sample support carried within the casing which support a sample container. An exothermic heat source includes a plurality of segments of exothermic material stacked one upon another to produce a desired temperature profile when ignited. The sample container is arranged within the core of the stacked exothermic heating material. Igniters are spaced vertically along the axis of the heating material to ignite the exothermic material at spaced points to provide total rapid burn and release of heat. To rapidly cool and quench the heat, a source of liquid carbon dixoide is provided which is conveyed through a conduit and a metering orifice into a distribution manifold where the carbon dioxide is gasified and dispersed around the exothermic heating material and the sample container via tubes for rapidly cooling the material sample. Author

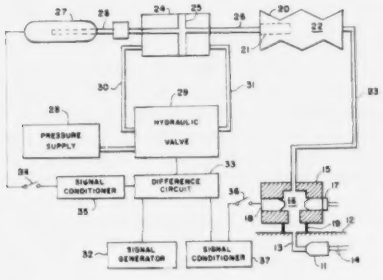
N85-29216*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
VIBRATION-FREE RAMAN DOPPLER VELOCIMETER Patent Application
R. J. EXTON, inventor (to NASA) 25 Apr. 1985 15 p
(NASA-CASE-LAR-13268-1; NAS 1.71:LAR-13268-1;
US-PATENT-APPL-SN-727034) Avail: NTIS HC A02/MF A01
CSCL 14B

A method and apparatus unaffected by vibrational environments for obtaining measurements using Raman Doppler Velocimetry is described. Two laser beams, a pump beam and a probe beam, are focused by a lens to a point in a flow. A lens collimates the two beams. A beam splitter dumps beam and the other beam is reflected by a corner cube back to lens. The other lens then focuses the beam back to the point. The reflected beam and the backward and forward scattering at the point are detected by a detector and processed by a boxcar averager. The lens and corner cube combination, called a retrometer ensure that the measurements are unaffected by vibrations. Author



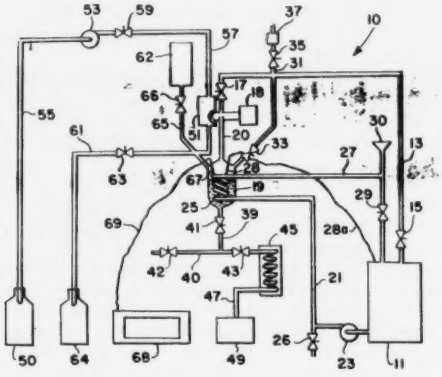
N85-29217*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
OSCILLATING PRESSURE DEVICE FOR DYNAMIC CALIBRATION OF PRESSURE TRANSDUCERS Patent Application
R. W. HESS, P. A. DAVIS, and W. T. DAVIS, inventors (to NASA) 14 Mar. 1985 8 p
(NASA-CASE-LAR-13094-1; NAS 1.71:LAR-13094-1;
US-PATENT-APPL-SN-711551) Avail: NTIS HC A02/MF A01
CSCL 14B

A method and apparatus for obtaining dynamic calibrations of pressure transducers is presented. A calibration head, a flexible tubing and a bellows enclose a volume of air at atmospheric pressure with a transducer to be calibrated subject to the pressure inside the volume. All of the other apparatus applies oscillations to the bellows causing the volume to change thereby applying oscillating pressures to the transducer whereby the transducer can be calibrated. Author



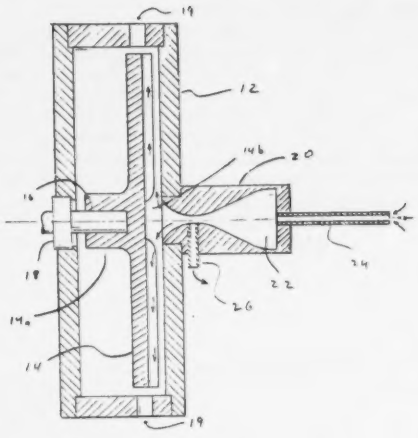
N85-29218*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
FLOW THROUGH BACTERIA DETECTION SYSTEM Patent Application
J. R. WILKINS and D. C. GRANA, inventors (to NASA) 4 Apr. 1985 21 p
(NASA-CASE-LAR-12871-1; NAS 1.71:LAR-12871-1; US-PATENT-APPL-SN-719797) Avail: NTIS HC A02/MF A01 CSCL 06B

A microbial detection system that automatically collects, incubates, and enumerates the micro-organisms within a water sample in a few hours, then sterilizes the system in order to prepare the system for another sample, is disclosed. Initially, the system is sterilized and then purged to remove residual organisms from the previous test. The sample is collected in accumulator until it reaches a predetermined level when intake valve is opened forcing the sample into incubator. The growth media is then introduced into incubator and the system is incubated for a duration dependent on the number of test organisms. Finally, the sample is dumped and the entire process is repeated for a new sample. The sample intake valve employs a unique combination of concentric dome valves and valve stems which are solenoid operated. The concentric dome valves provide a fluid intake port capable of reliable sterilization between sample intakes. Author



N85-29219*# National Aeronautics and Space Administration. Pasadena Office, Calif.
FLUIDIC ANGULAR VELOCITY SENSOR Patent Application
C. M. BERDAHL (JPL, Pasadena, Calif.) 4 Apr. 1985 19 p
(Contract NAS7-918)
(NASA-CASE-NPO-16479-1-CU; NAS 1.71:NPO-16479-1-CU; US-PATENT-APPL-SN-719794) Avail: NTIS HC A02/MF A01 CSCL 14B

A fluidic sensor providing a differential pressure signal proportional to the angular velocity of a rotary input is described. In one embodiment the sensor includes a fluid pump having an impeller coupled to a rotary input. A housing forming a constricting fluid flow chamber is connected to the fluid input of the pump. The differential pressure signal measured across the flow restrictive input is relatively noise free and proportional to the square of the angular velocity of the impeller. In an alternative embodiment, the flow chamber has a generally cylindrical configuration and plates having flow restrictive apertures are disposed within the chamber downstream from the housing port. In this embodiment, the differential pressure signal is found to be approximately linear with the angular velocity of the impeller. Author



N85-30281* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THREE-DIMENSIONAL AND TOMOGRAPHIC IMAGING DEVICE FOR X-RAY AND GAMMA-RAY EMITTING OBJECTS Patent
L. I. YIN, inventor (to NASA) 4 Jun. 1985 10 p Filed 21 Jan. 1983 Supersedes N83-20083 (21 - 10, p 1516)
(NASA-CASE-GSC-12851-1; US-PATENT-4,521,688; US-PATENT-APPL-SN-459842; US-PATENT-CLASS-250-363S; US-PATENT-CLASS-250-369) Avail: US Patent and Trademark Office CSCL 14B

An instrument for obtaining quantitative, three-dimensional and tomographic information relating to X-ray and gamma-ray emitting objects and for the orthoscopic viewing of such objects includes a multiple-pinhole aperture plate held spaced from an X-ray or gamma-ray to visible-light converter which is coupled to a visible-light image intensifier. The spacing between the aperture plate and the converter is chosen such that the mini-images of an emitting object formed by the pinholes do not substantially overlap as they impinge on the converter. The output of the image intensifier is digitized by a digitizing camera in terms of position and intensity and fed into a digital computer. The computer may output quantitative information relating to the emitting object directly, such as that relating to tomograms, or provide information in analogue form when coupled with a suitable viewing device to give an orthoscopic, three-dimensional image of the object.
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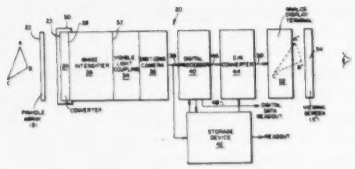

N85-30282* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DUAL DIFFERENTIAL INTERFEROMETER Patent
R. O. CLAUS (Virginia Polytechnic Inst. and State Univ., Blacksburg) and T. M. TURNER, inventors (to NASA) (Virginia Polytechnic Inst. and State Univ., Blacksburg) 23 Apr. 1985 6 p Filed 2 Sep. 1982 Sponsored by NASA
(NASA-CASE-LAR-12966-1; US-PATENT-4,512,661; US-PATENT-APPL-SN-414237; US-PATENT-CLASS-356-351; US-PATENT-CLASS-73-657; US-PATENT-CLASS-356-358)
Avail: US Patent and Trademark Office CSCL 14B

A dual two-beam differential interferometer that measures both the amplitude and orientation of propagating, broadband surface acoustic waves is disclosed. Four beams are focused on a surface. The four reflected beams are separated into two pairs. The two pairs are detected to produce two signals that are used to compute amplitude and orientation.

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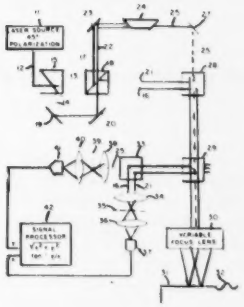
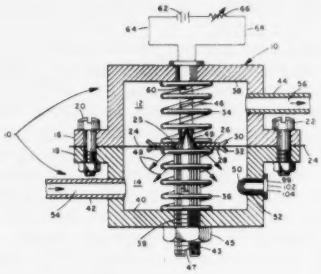


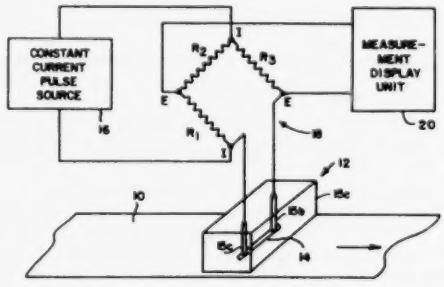
N85-30286*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
IMPROVED FLUID FLOW METER FOR MEASURING THE RATE OF FLUID FLOW IN A CONDUIT Patent Application
P. R. WHITE, inventor (to NASA) 4 Apr. 1985 16 p
(NASA-CASE-MFS-28030-1; NAS 1.71:MFS-28030-1; US-PATENT-APPL-SN-719799) Avail: NTIS HC A02/MF A01 CSCL 14B

A fluid flow rate meter is described. A tube fluid flow rate meter is comprised of a reservoir divided by flexible diaphragms into two separate, isolated compartments except for an orifice in the diaphragm. An incoming tube opens into a compartment and an outgoing tube opens into a compartment. An orifice is sized to allow maximum tube fluid flow. Opposing compression springs are secured within the two compartments with a bias diaphragm on opposite sides of orifice to maintain the orifice in a given position when the tube fluid pressure is zero. A tapered element is centered in, and extends through the orifice into the compartment leaving an annular opening between the element and the perimeter of orifice whose size varies as the diaphragm flexes with changes in tube fluid pressure to change the fluid flow through the opening. A light source directs light upon an element which scatters the light through the opening into the compartment. The light detector in the compartment senses the scattered light and generates a signal indicating the amount of fluid flow. R.J.F.



N85-34373* National Aeronautics and Space Administration. Pasadena Office, Calif.
INSTRUMENTATION FOR SENSING MOISTURE CONTENT OF MATERIAL USING A TRANSIENT THERMAL PULSE Patent
L. C. YANG, inventor (to NASA) (JPL, Pasadena, Calif.) 6 Aug. 1985 8 p Continuation of abandoned US-Patent-Appl-SN-325885 filed 30 Nov. 1981
(NAS 1.71:NPO-15494-2; US-PATENT-4,532,797; US-PATENT-APPL-SN-563890; US-PATENT-CLASS-73-75; US-PATENT-CLASS-324-65-P; NAS 1.71:NPO-15493-2) Avail: US Patent and Trademark Office CSCL 14B

Instrumentation for sensing moisture content of material using a transient thermal pulse is comprised of a sensing probe having a sensing element in the form of a ribbon excited by a constant current pulse from a source to increase the temperature and therefore the resistance of the ribbon linearly. Moisture in web material will limit the increase of temperature during the pulse in proportion to the moisture content. This increase in temperature produces a proportional increase in resistivity which is measured with a wheatstone bridge as a change in voltage displayed by a measurement display unit. The probe is glued in a shallow groove of a Lucite bar and connected to copper pins embedded in the bar. Official Gazette of the U.S. Patent and Trademark Office



N85-34374* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
MODULATED VOLTAGE METASTABLE IONIZATION DETECTOR Patent
G. C. CARLE, D. R. KOJIRO, and D. E. HUMPHREY, inventors (to NASA) 27 Aug. 1985 10 p Filed 22 Feb. 1984 Supersedes N84-23093 (22 - 13, p 2019)
(NASA-CASE-ARC-11503-1; US-PATENT-4,538,066; US-PATENT-APPL-SN-582643; US-PATENT-CLASS-250-374; US-PATENT-CLASS-250-379) Avail: US Patent and Trademark Office CSCL 14B

The output current from a metastable ionization detector (MID) is applied to a modulation voltage circuit. An adjustment is made to balance out the background current, and an output current, above background, is applied to an input of a strip chart recorder. For low level concentrations, i.e., low detected output current, the ionization potential will be at a maximum and the metastable ionization detector will operate at its most sensitive level. When the detected current from the metastable ionization detector increases above a predetermined threshold level, a voltage control circuit is activated which turns on a high voltage transistor which acts to reduce the ionization potential. The ionization potential applied to the metastable ionization detector is then varied so as to maintain the detected signal level constant. The variation in ionization potential is now related to the concentration of the constituent and a representative amplitude is applied to another input of said strip chart recorder.

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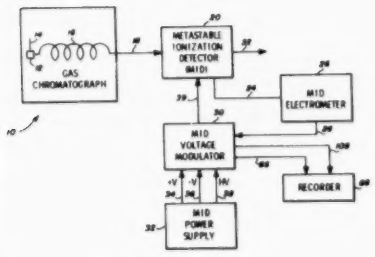
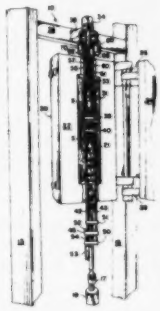


N85-34375* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
TENSILE TESTING APPARATUS Patent
L. B. BLACKBURN and J. R. ELLINGSWORTH, inventors (to NASA) 20 Aug. 1985 10 p Filed 19 Mar. 1984 Supersedes N84-20804 (22 - 11, p 1656)
(NASA-CASE-LAR-13243-1; US-PATENT-4,535,636; US-PATENT-APPL-SN-590923; US-PATENT-CLASS-73-831; US-PATENT-CLASS-73-856) Avail: US Patent and Trademark Office CSCL 14B

An improved mechanical extensometer is described for use with a constant load creep test machine. The dead weight of the extensometer is counterbalanced by two pairs of weights connected through a pulley system and to rod extension and leading into the furnace where the test sample is undergoing elevated temperature (above 500 F.) tensile testing. Novel gripper surfaces, conical tip and flat surface are provided in each sampling engaging platens to reduce the grip pressure normally required for attachment of the extensometer to the specimen and reduce initial specimen bending normally associated with foil-gage metal testing.

Official Gazette of the U.S. Patent and Trademark Office



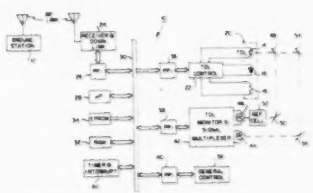
36

LASERS AND MASERS

Includes parametric amplifiers.

N85-29264* National Aeronautics and Space Administration. Pasadena Office, Calif.
DIGITAL CONTROL OF DIODE LASER FOR ATMOSPHERIC SPECTROSCOPY Patent
R. T. MENZIES (JPL, Pasadena, Calif.) and C. W. RUTLEDGE, inventors (to NASA) (JPL, Pasadena, Calif.) 2 Apr. 1985 10 p Filed 3 Jun. 1982 Sponsored by NASA
(NASA-CASE-NPO-16000-1; US-PATENT-4,509,130; US-PATENT-APPL-SN-384547; US-PATENT-CLASS-364-556; US-PATENT-CLASS-250-339) Avail: US Patent and Trademark Office CSCL 20E

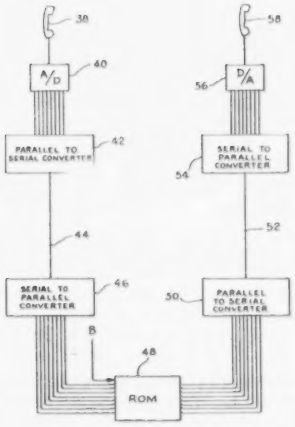
A system is described for remote absorption spectroscopy of trace species using a diode laser tunable over a useful spectral region of 50 to 200 cm(-1) by control of diode laser temperature over range from 15 K to 100 K, and tunable over a smaller region of typically 0.1 to 10 cm(-1) by control of the diode laser current over a range from 0 to 2 amps. Diode laser temperature and current set points are transmitted to the instrument in digital form and stored in memory for retrieval under control of a microprocessor during measurements. The laser diode current is determined by a digital to analog converter through a field effect transistor for a high degree of ambient temperature stability, while the laser diode temperature is determined by set points entered into a digital to analog converter under control of the microprocessor. Temperature of the laser diode is sensed by a sensor diode to provide negative feedback to the temperature control circuit that responds to the temperature control digital to analog converter. Author



36 LASERS AND MASERS

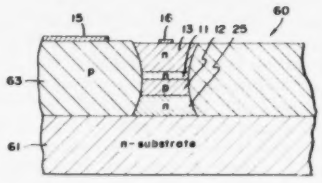
N85-29265*# National Aeronautics and Space Administration. Pasadena Office, Calif.
MAGNETICALLY SWITCHED POWER SUPPLY SYSTEMS FOR LASERS Patent Application
T. J. PACALA, inventor (to NASA) (JPL, Pasadena, Calif.) 19 Mar. 1985 26 p
(Contract NAS7-100)
(NASA-CASE-NPO-16402-1; NAS 1.71:NPO-16402-1; US-PATENT-APPL-SN-727931) Avail: NTIS HC A03/MF A01 CSCL 20E

A laser power supply system for exciting high power electric discharge gas lasers is described in which separate pulses are utilized to avalanche ionize the gas within the laser and then produce a sustained discharge to cause the gas to emit light energy. A pulsed voltage source is used to charge a storage device such as a distributed capacitance. A transmission line or other suitable electrical conductor connects the storage device to the laser. A saturable inductor switch is coupled in the transmission line for containing the energy within the storage device until the voltage level across the storage device reaches a predetermined level, which level is less than that required to avalanche ionize the gas. An avalanche ionization pulse-generating circuit is coupled to the laser for generating a high voltage pulse of sufficient amplitude to avalanche ionize the laser gas. Once the laser gas is avalanche ionized, the energy within the storage device is discharged through the saturable inductor switch into the laser to provide the sustained discharge. NASA



N85-30305* National Aeronautics and Space Administration. Pasadena Office, Calif.
ARRANGEMENT FOR DAMPING THE RESONANCE IN A LASER DIODE Patent
J. KATZ (JPL, Pasadena, Calif.), A. YARIV (JPL, Pasadena, Calif.), and S. MARGALIT, inventors (to NASA) (JPL, Pasadena, Calif.) 23 Apr. 1985 9 p Filed 4 Jun. 1982 Sponsored by NASA
(NASA-CASE-NPO-15980-1; US-PATENT-4,513,423; US-PATENT-APPL-SN-385220; US-PATENT-CLASS-372-50; US-PATENT-CLASS-357-17; US-PATENT-CLASS-357-40; US-PATENT-CLASS-357-46; US-PATENT-CLASS-372-46; US-PATENT-CLASS-372-38) Avail: US Patent and Trademark Office CSCL 20E

An arrangement for damping the resonance in a laser diode is described. This arrangement includes an additional layer which together with the conventional laser diode form a structure (35) of a bipolar transistor. Therein, the additional layer serves as the collector, the cladding layer next to it as the base, and the active region and the other cladding layer as the emitter. A capacitor is connected across the base and the collector. It is chosen so that at any frequency above a certain selected frequency which is far below the resonance frequency the capacitor impedance is very low, effectively shorting the base to the collector.
Official Gazette of the U.S. Patent and Trademark Office



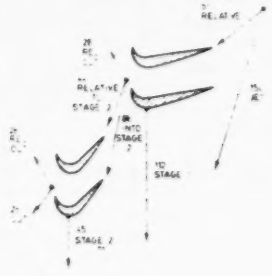
37

MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

N85-29282* National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD FOR DRIVING TWO-PHASE TURBINES WITH ENHANCED EFFICIENCY Patent
D. G. ELLIOTT, inventor (to NASA) (JPL, Pasadena, Calif.) 30 Apr. 1985 6 p Filed 30 Sep. 1982 Continuation of abandoned US Patent Appl-SN-161257, filed 20 Jun. 1980 Sponsored by NASA
(NASA-CASE-NPO-15037-2; US-PATENT-4,514,137; US-PATENT-APPL-SN-431420; US-PATENT-APPL-SN-161257; US-PATENT-CLASS-415-1; US-PATENT-CLASS-415-68) Avail: US Patent and Trademark Office CSCL 21E

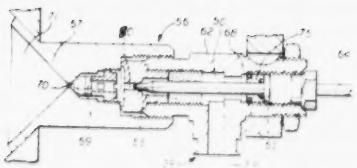
A method for driving a two phase turbine characterized by an output shaft having at least one stage including a bladed rotor connected in driving relation with the shaft is described. A two phase fluid is introduced into one stage at a known flow velocity and caused to pass through the rotor for imparing angular velocity thereto. The angular velocity of the rotor is maintained at a value such that the angular velocity of the tips of the blades of the rotor is a velocity equal to at least 50% of the velocity of the flow of the two phase fluid.
Official Gazette of the U.S. Patent and Trademark Office



N85-29283* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,
SPRAY APPLICATOR FOR SPRAYING COATINGS AND OTHER FLUIDS IN SPACE Patent
J. F. KUMINECZ and M. F. LAUSTEN, inventors (to NASA) 28 May 1985 7 p Filed 25 Jun. 1982
(NASA-CASE-MSC-18852-1; US-PATENT-4,519,545;
US-PATENT-APPL-SN-392094; US-PATENT-CLASS-239-288;
US-PATENT-CLASS-239-322; US-PATENT-CLASS-239-327;
US-PATENT-CLASS-239-375; US-PATENT-CLASS-239-590;
US-PATENT-CLASS-239-DIG.23; US-PATENT-CLASS-55-DIG.42)
Avail: US Patent and Trademark Office CSCL 13I

A self contained spray application is developed for one handed operation in a zero gravity vacuum environment by a free flying astronaut not attached to any spacecraft. This spray applicator eliminates contamination of the operator by back spray. This applicator includes a rigid accumulator containment of a fluid within a flexible bladder the fluid being urged out of the accumulator under pressure through a spray gun. The spray gun includes a spring loaded lockable trigger which controls a valve. When in an open position, the fluid passes through the valve into the ambient environment in the form of a spray. A spray shield is provided which directs the flow of the spray from the applicator by trapping errant particles of spray yet allowing the passage of escaping gases through its material.

Official Gazette of the U.S. Patent and Trademark Office



N85-29284* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,
LINEAR MOTION VALVE Patent
J. A. CHANDLER, inventor (to NASA) 18 Jun. 1985 5 p Filed 31 Jul. 1984
(NASA-CASE-MSC-20148-1; US-PATENT-4,523,741;
US-PATENT-APPL-SN-636465; US-PATENT-CLASS-251-325;
US-PATENT-CLASS-251-349; US-PATENT-CLASS-251-353;
US-PATENT-CLASS-277-80; US-PATENT-CLASS-277-135)
Avail: US Patent and Trademark Office CSCL 13K

The linear motion valve is described. The valve spool employs magnetically permeable rings, spaced apart axially, which engage a sealing assembly having magnetically permeable pole pieces in magnetic relationship with a magnet. The gap between the ring and the pole pieces is sealed with a ferrofluid. Depletion of the ferrofluid is minimized.

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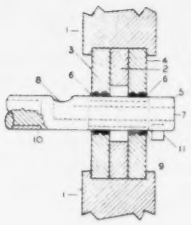
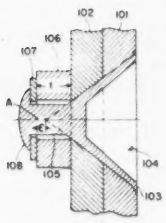


N85-29285* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DAZE FASTENERS Patent
L. R. JACKSON, R. C. DAVIS, and A. H. TAYLOR, inventors (to NASA) 23 Apr. 1985 9 p Filed 17 May 1983
(NASA-CASE-LAR-13009-1; US-PATENT-4,512,699;
US-PATENT-APPL-SN-495380; US-PATENT-CLASS-411-368;
US-PATENT-CLASS-403-28; US-PATENT-CLASS-403-408;
US-PATENT-CLASS-411-378; US-PATENT-CLASS-411-426;
US-PATENT-CLASS-411-501; US-PATENT-CLASS-411-531)
Avail: US Patent and Trademark Office CSCL 13E

A daze fastener system for connecting two or more structural elements wherein the structural elements and fastener parts have substantially different coefficient of thermal expansion physical property characteristics is employed in this invention. By providing frusto-conical abutting surfaces between the structural elements and fastener parts any differences in thermal expansion/contraction between the parts is translated to sliding motion and avoids deleterious thermal stresses in the connection. An essential feature for isotropic homogeneous material connections is that at least two sets of mating surfaces are required wherein each set of mating surfaces have line element extensions that pass through a common point.

Author

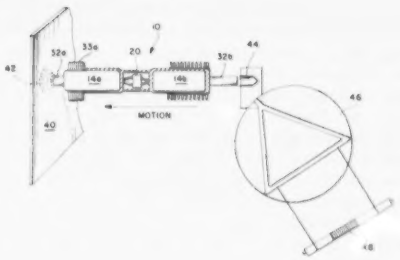


N85-29286* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PRECISION MANIPULATOR HEATING AND COOLING APPARATUS FOR USE IN UHV SYSTEMS WITH SAMPLE TRANSFER CAPABILITY Patent
R. A. OUTLAW and B. T. BAUGH, inventors (to NASA) 14 May 1985 6 p Filed 31 Oct. 1983 Sponsored by NASA
(NASA-CASE-LAR-13040-1; US-PATENT-4,516,435; US-PATENT-APPL-SN-547176; US-PATENT-CLASS-73-863.11; US-PATENT-CLASS-73-864.81; US-PATENT-CLASS-219-201; US-PATENT-CLASS-219-221; US-PATENT-CLASS-219-285; US-PATENT-CLASS-414-217) Avail: US Patent and Trademark Office CSCL 13I

An improvement of a precision manipulator for use in ultrahigh vacuum (UHV) system with sample transfer capability in which a spring loaded thermocouple and a heater electrode are both in direct contact with the transferred sample is discussed. The thermocouple and heater electrode assembly are mounted concentric with a sample receiving block on the end of an offset manipulator. Hence, when a sample is transferred from an introduction chamber into the UHV chamber, it contacts the spring loaded thermocouple and then seats a heater electrode. Cooling by a copper plate and a strap combined with the resistance heating capability allow sample temperatures over the range of 150 to 1750 K while positioned in front of any diagnostic instrument in the UHV system and while taking data with these instruments.
Official Gazette of the U.S. Patent and Trademark Office

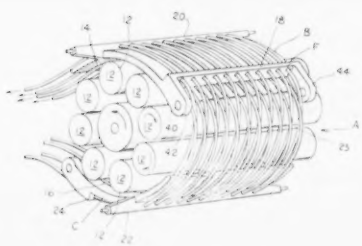
N85-29287*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
FULLY REDUNDANT MECHANICAL RELEASE ACTUATOR Patent Application
M. H. LUCY, inventor (to NASA) 2 May 1985 16 p
(NASA-CASE-LAR-13198-1; NAS 1.71:LAR-13198-1; US-PATENT-APPL-SN-729704) Avail: NTIS HC A02/MF A01 CSCL 13E

A system is described for performing a mechanical release function exhibiting low shock. This system includes two pyrotechnic detents fixed mounted in opposing axial alignment within a cylindrical housing having two mechanical bellows. Two mechanical bellow assemblies, each having one end hermetically bonded to the housing and the other to the respective actuator pin extending from either end of the housing, ensure that all outgassing and contamination from the operation of the pyrotechnic devices will be contained within the housing and bellows. The pin on one end of the assembly is fixed mounted and supported, via a bolt or ball and socket joint so that when the charge corresponding to that pin ignites, the entire assembly will exhibit rectilinear movement, including the opposing pin providing the unlatching motion.
NASA



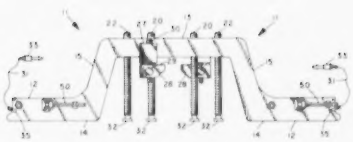
N85-29288*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
REMOTELY OPERABLE PERISTALTIC PUMP Patent Application
R. R. BELEW, inventor (to NASA) 7 Mar. 1985 16 p
(NASA-CASE-MFS-28059-1; NAS 1.71:MFS-28059-1; US-PATENT-APPL-SN-709255) Avail: NTIS HC A02/MF A01 CSCL 13K

A peristaltic pump is disclosed which includes a roller assembly on which is mounted a series of pump rollers. As the roller assembly is rotated by a drive gear the pump rollers are driven in reverse rotation by means of a stationary ring gear and pump roller gears. An upper pressure shoe plate and a lower pressure shoe plate are positioned above sets of flexible tubing. The tubing is sandwiched between the pressure shoe plates and the pump rollers. A highly compact pump is provided having twice as many fluid channel lines as is conventional. The peristaltic pump device may be remotely operated by means of a rotary actuator which rotates a driving hub, to move the shoe plates by means of eccentric mounted links. The pressure shoe plates may be moved by the rotary actuator to a loaded position in which the fluid lines are pinched by the pump rollers and fluid is pumped to an unloaded position in which the fluid lines are maintained in an undeformed, uncrimped configuration so that no creases or crimps are set into the fluid lines during periods of prolonged non-use. NASA



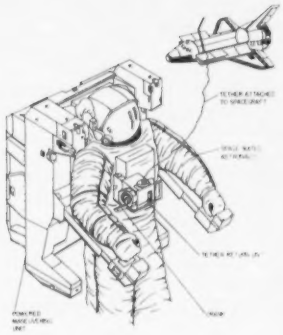
N85-29289*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ALIGNMENT AND ASSEMBLY TOOL FOR VERY LARGE DIAMETER CYLINDERS Patent Application
J. H. EHL, inventor (to NASA) 31 May 1985 18 p
(NASA-CASE-MFS-28001-1; NAS 1.71:MFS-28001-1; US-PATENT-APPL-SN-739788) Avail: NTIS HC A02/MF A01 CSCL 13I

A tool used to accurately align and hold very large diameter cylinders together for weld assembly is described. The tool has a U-shaped main body with a horizontal top section and two legs, which are attached to the end of top section and extend outward and downward. Horizontal bottom sections extend outward from the bottoms of legs. The tool has one inner jackscrew and one outer jackscrew on each side of its center, extending downward from top section. Each of the two bottom sections has an attached side clamp for clamping the alignment tool to two opposing skin stringers of cylinders. The jackscrews are adjusted to bring the edges of the ring into precise alignment with the ends of the two large cylinders and so that both joints may be welded around their full circumference. NASA



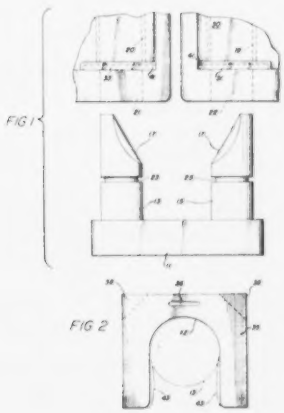
N85-29290*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
NON-BACKDRIVEABLE FREE WHEELING COUPLING Patent Application
W. R. LLEWELLIN, inventor (to NASA) (Martin Marietta Aerospace, Bethesda, Md.) 22 Apr. 1985 11 p Sponsored by NASA
(NASA-CASE-MSC-20475-1; NAS 1.71:MSC-20475-1; US-PATENT-APPL-SN-725689) Avail: NTIS HC A02/MF A01 CSCL 13I

A rotary coupling for connecting a driven part to a source of rotary force is described. This device transmits rotary force in one direction only and disengages to permit the driven part to free wheel when the input member is stopped and precludes the backdriving of rotary force from output member to input member. The coupling includes an input member having a splined shaft, a coupling member connected to the splined shaft, and a co-axial output member. The coupling member and the output member having complementary sets of axially facing clutch teeth. Guides in the form of helical grooves on the coupling member and spring loaded followers acting with the guides affect them engagement and disengagement of the clutch teeth by moving the coupling member toward and away from output member, the followers and guides themselves disengaging to permit free wheeling of output member when input member is stopped. NASA



N85-29291*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
IMPROVEMENTS IN TANK TREAD ASSEMBLIES Patent Application
E. R. COLLINS, JR., inventor (to NASA) 18 Jan. 1985 14 p
(NASA-CASE-NPO-16321-1; NASA-CASE-NPO-16322-1; NAS 1.71:NPO-16321-1; NAS 1.71:NPO-16322-1; US-PATENT-APPL-SN-692802) Avail: NTIS HC A02/MF A01 CSCL 13F

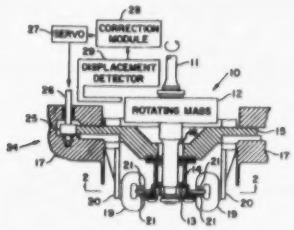
The proposed tank tread assembly has adjacent tank tread segments joined by a link bearing tapered pins retained by clips inserted through the tread shells perpendicular to the axes of the pins. It also has highway pads attached by a release rod bearing tapered, grooved cams which interlockingly engage tabs inserted into the tread shells. NASA



37 MECHANICAL ENGINEERING

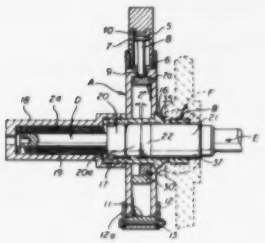
N85-30333* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
VARIABLE FORCE, EDDY-CURRENT OR MAGNETIC DAMPER Patent
R. E. CUNNINGHAM, inventor (to NASA) 14 May 1985 6 p Filed 3 Feb. 1983
(NASA-CASE-LEW-13717-1; US-PATENT-4,517,505; US-PATENT-APPL-SN-463456; US-PATENT-CLASS-318-611; US-PATENT-CLASS-310-77; US-PATENT-CLASS-310-93; US-PATENT-CLASS-335-100) Avail: US Patent and Trademark Office CSCL 13I

An object of the invention is to provide variable damping for resonant vibrations which may occur at different rotational speeds in the range of rpms in which a rotating machine is operated. A variable force damper in accordance with the invention includes a rotating mass carried on a shaft which is supported by a bearing in a resilient cage. The cage is attached to a support plate whose rim extends into an annular groove in a housing. Variable damping is effected by tabs of electrically conducting nonmagnetic material which extend radially from the cage. The tabs at an index position lie between the pole face of respective C shaped magnets. The magnets are attached by cantilever spring members to the housing. Author



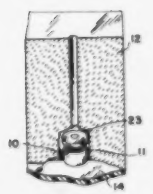
N85-30334* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,
SLIDE RELEASE MECHANISM Patent
J. W. BUNKER (TransTechnology Corp.) and R. S. RITCHIE, inventors (to NASA) (TransTechnology Corp.) 23 Apr. 1985 8 p Filed 30 Jun. 1982 Supersedes N82-31688 (20 - 22, p 3137)
(NASA-CASE-MSC-20080-1; US-PATENT-4,512,678; US-PATENT-APPL-SN-393584; US-PATENT-CLASS-403-15; US-PATENT-CLASS-403-16; US-PATENT-CLASS-403-322; US-PATENT-CLASS-89-1.57) Avail: US Patent and Trademark Office CSCL 13E

A releasable support device is described which is comprised of a hollow body with a sleeve extending transversely there-through for receiving the end of a support shank. A slider-latch, optionally lubricated, extends through side recesses in the sleeve to straddle the shank, respectively, in latched and released positions. The slider-latch is slid from its latched to its unlatched position by a pressure squib whereupon a spring or other pressure means pushes the shank out of the sleeve. At the same time, a follower element is lodged in and closed the hole in the body wall from which the shank was discharged. The mechanism was designed for the shuttle orbiter/external tank connection device.
Official Gazette of the U.S. Patent and Trademark Office



N85-30335* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MECHANICAL FASTENER Patent
A. B. STACEY, JR., inventor (to NASA) 4 Jun. 1985 7 p Filed 7 Oct. 1983 Sponsored by NASA
(NASA-CASE-LAR-12738-2; US-PATENT-4,520,601; US-PATENT-APPL-SN-539230; US-PATENT-CLASS-52-127.7; US-PATENT-CLASS-52-745; US-PATENT-CLASS-52-506; US-PATENT-CLASS-411-103; US-PATENT-CLASS-411-108; US-PATENT-CLASS-244-158-A) Avail: US Patent and Trademark Office CSCL 13E

A device for fastening a temporary replacement heat shield tile to the strain isolation pad of a space vehicle is disclosed. An internally treaded, flanged cylinder is rotatably connected to a threaded brass plug through a flanged aluminum sleeve to form the device. The device is adhesively attached to the replacement title before using. In using the device, the tile containing the device is placed against the strain isolation pad of the space vehicle such that the flanged portion of the flanged cylinder rests against the strain isolation pad. This flanged portion, which consists of a plurality of L shaped blades, is then rotated into the strain isolation pad. The brass plug is then rotated with respect to the flanged stainless steel cylinder to draw the tile snuggly against isolation pad and thus complete the fastening process.
Official Gazette of the U.S. Patent and Trademark Office

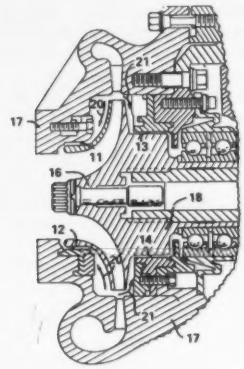


N85-30336* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SELF-LOCKING MECHANICAL CENTER JOINT Patent
H. G. BUSH and R. E. WALLSOM, inventors (to NASA) (Kentron International, Hampton, Va.) 21 May 1985 10 p Filed 11 Jun. 1982
(NASA-CASE-LAR-12864-1; US-PATENT-4,518,277; US-PATENT-APPL-SN-387646; US-PATENT-CLASS-403-102; US-PATENT-CLASS-403-322; US-PATENT-CLASS-403-348) Avail: US Patent and Trademark Office CSCL 13I

A device for connecting, rotating and locking together a pair of structural half columns is described. The device is composed of an identical pair of cylindrical hub assemblies connected at their inner faces by a spring loaded hinge; each hub assembly having a structural half column attached to its outer end. Each hub assembly has a spring loading locking ring member movably attached adjacent to its inner face and includes a latch member for holding the locking ring in a rotated position subject to the force of its spring. Each hub assembly also has a hammer member for releasing the latch on the opposing hub assembly when the hub assemblies are rotated together. The spring loaded hinge connecting the hub assemblies rotates the hub assemblies and attached structural half columns together bringing the inner faces of the opposing hub assemblies into contact with one another. Official Gazette of the U.S. Patent and Trademark Office

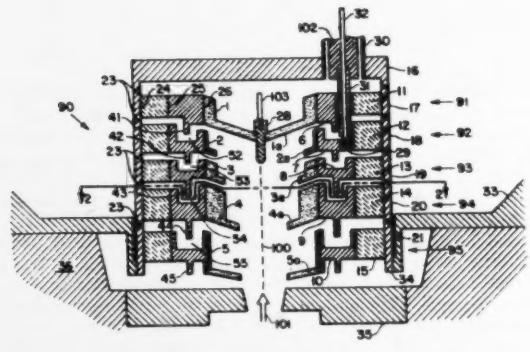
N85-30341*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DAMPING SEAL FOR TURBOMACHINERY Patent Application
G. L. VONPRAGENAU, inventor (to NASA) 18 Jan. 1985 11 p
(NASA-CASE-MFS-25842-2; NAS 1.71:MFS-25842-2; US-PATENT-APPL-SN-6692875) Avail: NTIS HC A02/MF A01 CSCL 11A

A damping seal between a high speed rotor member and stator member that separates pressurized fluid compartments is described. It is characterized by the rotor member having a smooth outer surface and the stator member having its bore surface roughened by a plurality of pockets or depressions. NASA



N85-33489* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MULTISTAGE SPENT PARTICLE COLLECTOR AND A METHOD FOR MAKING SAME Patent
B. T. EBIHARA, inventor (to NASA) 2 Jul. 1985 7 p Filed 30 Sep. 1983 Supersedes N84-12447 (22 - 03, p 0376)
(NASA-CASE-LEW-13914-1; US-PATENT-4,527,092; US-PATENT-APPL-SN-537615; US-PATENT-CLASS-315-5.38; US-PATENT-CLASS-315-3.5; US-PATENT-CLASS-445-35) Avail: US Patent and Trademark Office CSCL 13I

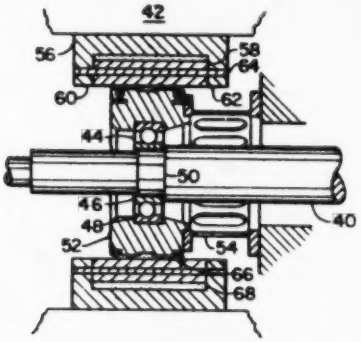
A description is given of a spent particle collector which maintains structural integrity when raised to a high temperature although constructed of materials having widely different coefficients of expansion. The collector is comprised of one or more axisymmetric stages, each stage comprising a subassembly. A subassembly includes an inner pyrolytic graphite ring, a transition ring, a ceramic insulator ring and an outer metal ring which forms part of the wall of the collector. Each transition is of a ductile metal having high thermal conductivity and is provided with an annular sputter shield wall extending toward the source of spent particles and, where necessary, a trough in the other surface to enclose the sputter shield of the next adjacent transition ring. A plurality of radial extending slots are provided in a transition ring to form segments which are retained in their position by the sputter shield. Official Gazette of the U.S. Patent and Trademark Office



N85-33490* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DUAL CLEARANCE SQUEEZE FILM DAMPER Patent
D. P. FLEMING, inventor (to NASA) 9 Jul. 1985 8 p Filed 5 Apr. 1984 Supersedes N84-22562 (22 - 13, p 1932)
(NASA-CASE-LEW-13506-1; US-PATENT-4,527,910;
US-PATENT-APPL-SN-596960; US-PATENT-CLASS-384-99;
US-PATENT-CLASS-384-101) Avail: US Patent and Trademark Office CSCL 13I

A dual clearance hydrodynamic liquid squeeze film damper for a gas turbine engine is described. Under normal operating conditions, the device functions as a conventional squeeze film damper, using only one of its oil films. When an unbalance reaches abusive levels, as may occur with a blade loss or foreign object damage, a second, larger clearance film becomes active, controlling vibration amplitudes in a near optimum manner until the engine can be safely shut down and repaired.

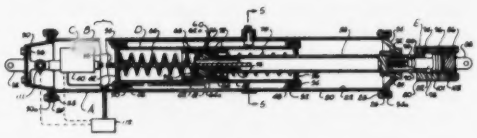
Official Gazette of the U.S. Patent and Trademark Office



N85-34401* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
VARIABLE LENGTH STRUT WITH LONGITUDINAL COMPLIANCE AND LOCKING CAPABILITY Patent
R. R. BELEW, inventor (to NASA) 20 Aug. 1985 8 p Filed 1 Jul. 1983 Supersedes N83-31019 (21 - 19, p 3145)
(NASA-CASE-MFS-25907-1; US-PATENT-4,536,114;
US-PATENT-APPL-SN-510137; US-PATENT-CLASS-410-156;
US-PATENT-CLASS-244-118.1; US-PATENT-CLASS-244-158R;
US-PATENT-CLASS-248-550; US-PATENT-CLASS-267-8R;
US-PATENT-CLASS-267-150) Avail: US Patent and Trademark Office CSCL 12I

A variable length strut device is illustrated for connecting two associated structures which includes an outer load bearing shell, a drive assembly, a length varying compliance assembly positioned by drive assembly, and a strut rod locking assembly. The load bearing shell includes a connecting part adapted for connection to a first associated structure. A strut connection rod has a connecting part adapted for connection to a second associated structure and a distal end having a piston driver slidably carried in a housing of compliance assembly. Two compliance pistons act in opposing directions on the piston driver to provide longitudinal compliance in a compliance mode of operation. Locking assembly includes locking balls which are urged in a locking ring as locking bolt is urged to the left by fluid pressure. Microswitches sense the displacement of pistons away from the internal ring to bring the pistons to a neutral position wherein the pistons are in contact with the internal ring when it is desired to do so as affected by a control source.

Official Gazette of the U.S. Patent and Trademark Office



N85-34402* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OXIDIZING SEAL FOR A TURBINE TIP GAS PATH Patent
J. D. CAWLEY, inventor (to NASA) 10 Sep. 1985 7 p Filed 19 Apr. 1984 Supersedes N84-22935 (22 - 13, p 1993)
(NASA-CASE-LEW-14053-1; US-PATENT-4,540,336;
US-PATENT-APPL-SN-602050; US-PATENT-CLASS-415-174;
US-PATENT-CLASS-415-170-R; US-PATENT-CLASS-415-196;
US-PATENT-CLASS-415-200; US-PATENT-CLASS-416-174)
Avail: US Patent and Trademark Office CSCL 11A

The sealing of the gas path in a gas turbine engine at the blade tips is improved by maintaining a minimum clearance between the rotor blade tips and the gas path seal. This is accomplished by taking advantage of an increase in volume during controlled oxidation of certain intermetallic compounds which have high melting points. The increase in volume closes the clearance subsequent to a rub between the blades and the seal. Thus, these compounds re-form the tip seal surface to assure continued engine efficiency.

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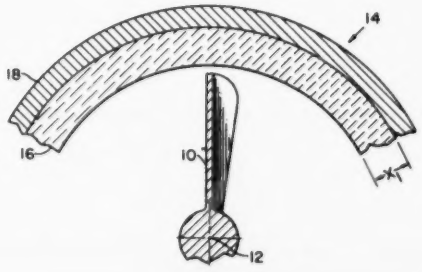

N85-34403* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,
REACTANT PRESSURE DIFFERENTIAL CONTROL FOR FUEL CELL GASES Patent
A. P. GRASSO, inventor (to NASA) (United Technologies Corp., South Windsor, Conn.) 9 Apr. 1985 5 p Continuation of abandoned US-Patent-Appl-SN-394344 filed 1 Jul. 1982
(NASA-CASE-MSC-20127-2; US-PATENT-4,509,548;
US-PATENT-APPL-SN-646044; US-PATENT-CLASS-137-99;
US-PATENT-CLASS-137-116.3) Avail: US Patent and Trademark Office CSCL 13K

A pair of spool valves are described which are balanced between pressures of reactant gases supplied to a fuel cell power plant. The pressure differences are controlled between the gases so as to maintain those pressures substantially in the proportions necessary for operation of the fuel cell.

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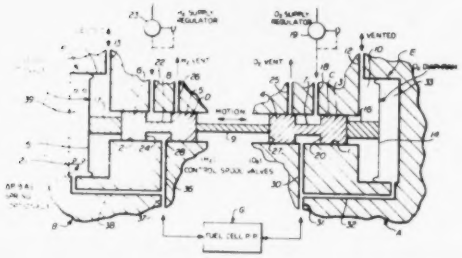

44

ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

N85-30474* National Aeronautics and Space Administration. Pasadena Office, Calif.
STABLE DENSITY STRATIFICATION SOLAR POND
F. L. LANSING, inventor (to NASA) (JPL, Pasadena, Calif.) 23 Apr. 1985 8 p Filed 18 Oct. 1983 Continuation-in-part of abandoned US-Patent-Appl-SN-259208, filed 30 Apr. 1981 Sponsored by NASA
(NASA-CASE-NPO-15419-2; US-PATENT-4,512,332;
US-PATENT-APPL-SN-542557; US-PATENT-APPL-SN-259208;
US-PATENT-CLASS-126-415; US-PATENT-CLASS-126-400;
US-PATENT-CLASS-126-900; US-PATENT-CLASS-126-419;
US-PATENT-CLASS-126-DIG.1) Avail: US Patent and Trademark Office CSCL 10A

A stable density-stratification solar pond for use in the collection and storage of solar thermal energy including a container having a first section characterized by an internal wall of a substantially cylindrical configuration and a second section having an internal wall of a substantially truncated conical configuration surmounting the first section in coaxial alignment therewith, the second section of said container being characterized by a base of a diameter substantially equal to the diameter of the first section and a truncated apex defining a solar energy acceptance opening is discussed. A body of immiscible liquids is disposed within the container and comprises a lower portion substantially filling the first section of the container and an upper portion substantially filling the second section of the container, said lower portion being an aqueous based liquid of a darker color than the upper portion and of a greater density. A protective cover plate is removably provided for covering the acceptance opening.

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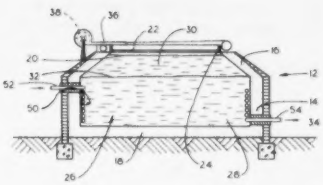
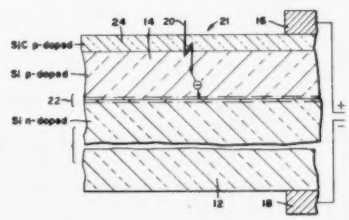


N85-30475* National Aeronautics and Space Administration. Pasadena Office, Calif.
INCREASED VOLTAGE PHOTOVOLTAIC CELL Patent
B. ROSS (JPL, Pasadena, Calif.), D. B. BICKLER (JPL, Pasadena, Calif.), and B. D. GALLAGHER, inventors (to NASA) (JPL, Pasadena, Calif.) 18 Jun. 1985 5 p Filed 8 Feb. 1984 Sponsored by NASA
(NASA-CASE-NPO-16155-1; US-PATENT-4,524,237;
US-PATENT-APPL-SN-578390; US-PATENT-CLASS-136-261;
US-PATENT-CLASS-136-255; US-PATENT-CLASS-136-256;
US-PATENT-CLASS-357-30) Avail: US Patent and Trademark Office CSCL 10A

A photovoltaic cell, such as a solar cell, is provided which has a higher output voltage than prior cells. The improved cell includes a substrate of doped silicon, a first layer of silicon disposed on the substrate and having opposite doping, and a second layer of silicon carbide disposed on the first layer. The silicon carbide preferably has the same type of doping as the first layer. Author



44 ENERGY PRODUCTION AND CONVERSION

N85-34441* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMIONIC PHOTOVOLTAIC ENERGY CONVERTER Patent
D. L. CHUBB, inventor (to NASA) 9 Jul. 1985 7 p Filed 15 Feb. 1984 Supersedes N84-20918 (22 - 11, p 1673)
(NASA-CASE-LEW-14077-1; US-PATENT-4,528,417;
US-PATENT-APPL-SN-580573; US-PATENT-CLASS-136-253)
Avail: US Patent and Trademark Office CSCL 10A

A thermionic photovoltaic energy conversion device comprises a thermionic diode mounted within a hollow tubular photovoltaic converter. The thermionic diode maintains a cesium discharge for producing excited atoms that emit line radiation in the wavelength region of 850 nm to 890 nm. The photovoltaic converter is a silicon or gallium arsenide photovoltaic cell having bandgap energies in this same wavelength region for optimum cell efficiency.

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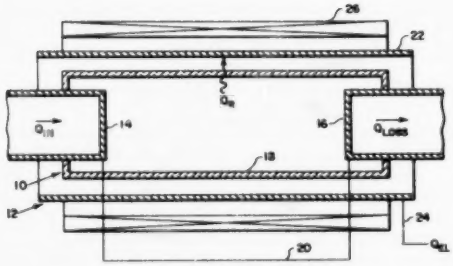


52

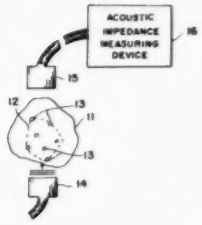
AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and weightlessness.

N85-30618* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
METHOD FOR THERMAL MONITORING SUBCUTANEOUS TISSUE Patent
J. S. HEYMAN and G. H. BRANDENBURGER, inventors (to NASA) (Virginia Associated Research Center) 30 Apr. 1985 6 p Filed 22 Feb. 1984 Sponsored by NASA
(NASA-CASE-LAR-13028-1; US-PATENT-4,513,750;
US-PATENT-APPL-SN-582492; US-PATENT-CLASS-128-660;
US-PATENT-CLASS-128-736; US-PATENT-CLASS-374-117;
US-PATENT-CLASS-374-160) Avail: US Patent and Trademark Office CSCL 06B

A noninvasive accurate method for measuring the temperature of tissue beneath the surface of a living body is described. Ultrasonic signals are directed into beads of a material that are inserted into the tissue with a syringe. The reflected signals indicate the acoustic impedance or resonance frequency of the beads which in turn indicates the temperature of the tissue. A range of temperatures around the melting temperature of the material can be measured by this method.

Official Gazette of the U.S. Patent and Trademark Office



60

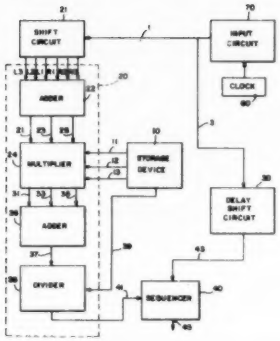
COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.

N85-33701* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD OF AND APPARATUS FOR GENERATING AN INTERSTITIAL POINT IN A DATA STREAM HAVING AN EVEN NUMBER OF DATA POINTS Patent
T. R. EDWARDS, inventor (to NASA) 9 Jul. 1985 12 p Filed 29 Oct. 1982 Supersedes N83-12932 (21 - 03, p 0447)
(NASA-CASE-MFS-25319-1; US-PATENT-4,528,639;
US-PATENT-APPL-SN-437917; US-PATENT-CLASS-364-723;
US-PATENT-CLASS-364-853) Avail: US Patent and Trademark Office CSCL 09B

Apparatus for doubling the data density rate of an analog to digital converter or doubling the data density storage capacity of a memory deviced is discussed. An interstitial data point midway between adjacent data points in a data stream having an even number of equal interval data points is generated by applying a set of predetermined one-dimensional convolute integer coefficients which can include a set of multiplier coefficients and a normalizer coefficient. Interpolator means apply the coefficients to the data points by weighting equally on each side of the center of the even number of equal interval data points to obtain an interstital point value at the center of the data points. A one-dimensional output data set, which is twice as dense as a one-dimensional equal interval input data set, can be generated where the output data set includes interstitial points interdigitated between adjacent data points in the input data set. The method for generating the set of interstital points is a weighted, nearest-neighbor,

non-recursive, moving, smoothing averaging technique, equivalent to applying a polynomial regression calculation to the data set.
Official Gazette of the U.S. Patent and Trademark Office



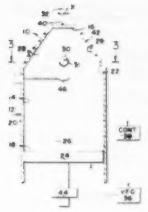
71

ACOUSTICS

Includes sound generation, transmission, and attenuation.

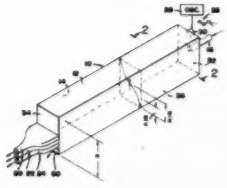
N85-29693* National Aeronautics and Space Administration. Pasadena Office, Calif.
GRAVITY ENHANCED ACOUSTIC LEVITATION METHOD AND APPARATUS Patent
M. B. BARMATZ (JPL, Pasadena, Calif.), J. L. ALLEN (JPL, Pasadena, Calif.), and D. GRANETT, inventors (to NASA) (JPL, Pasadena, Calif.) 4 Jun. 1985 6 p Filed 9 Dec. 1983 Sponsored by NASA
(NASA-CASE-NPO-16147-1-CU; US-PATENT-4,520,656; US-PATENT-APPL-SN-559988; US-PATENT-CLASS-73-505)
Avail: US Patent and Trademark Office CSCL 20A

An acoustic levitation system is provided for acoustically levitating an object by applying a single frequency from a transducer into a resonant chamber surrounding the object. The chamber includes a stabilizer location along its height, where the side walls of the chamber are angled so they converge in an upward direction. When an acoustic standing wave pattern is applied between the top and bottom of the chamber, a levitation surface within the stabilizer does not lie on a horizontal plane, but instead is curved with a lowermost portion near the vertical axis of the chamber. As a result, an acoustically levitated object is urged by gravity towards the lowermost location on the levitation surface, so the object is kept away from the side walls of the chamber.
Official Gazette of the U.S. Patent and Trademark Office



N85-30765* National Aeronautics and Space Administration. Pasadena Office, Calif.
ACOUSTIC PARTICLE SEPARATION Patent
M. B. BARMATZ (JPL, Pasadena, Calif.), J. D. STONEBURNER (JPL, Pasadena, Calif.), N. JACOBI (JPL, Pasadena, Calif.), and T. WANG, inventors (to NASA) (JPL, Pasadena, Calif.) 18 Jun. 1985 8 p Filed 19 May 1982 Sponsored by NASA
(NASA-CASE-NPO-155559-1; US-PATENT-4,523,682; US-PATENT-APPL-SN-379601; US-PATENT-CLASS-209-638; US-PATENT-CLASS-209-422; US-PATENT-CLASS-181-0.5)
Avail: US Patent and Trademark Office CSCL 20A

A method is described which uses acoustic energy to separate particles of different sizes, densities, or the like. The method includes applying acoustic energy resonant to a chamber containing a liquid of gaseous medium to set up a standing wave pattern that includes a force potential well wherein particles within the well are urged towards the center, or position of minimum force potential. A group of particles to be separated is placed in the chamber, while a non-acoustic force such as gravity is applied, so that the particles separate with the larger or denser particles moving away from the center of the well to a position near its edge and progressively smaller lighter particles moving progressively closer to the center of the well. Particles are removed from different positions within the well, so that particles are separated according to the positions they occupy in the well.
Official Gazette of the U.S. Patent and Trademark Office



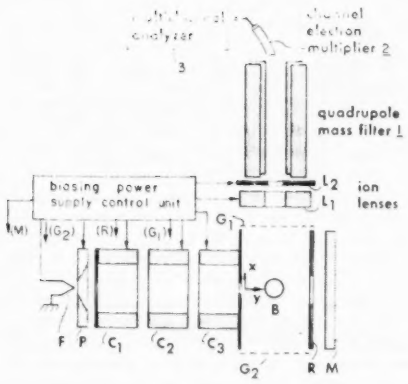
72

ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra.

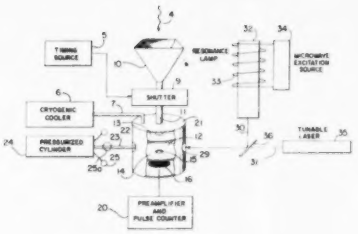
N85-29701*# National Aeronautics and Space Administration. Pasadena Office, Calif.
GENERATION OF INTENSE NEGATIVE ION BEAMS Patent Application
A. CHUTJIAN (JPL, Pasadena, Calif.), O. J. ORIENT (JPL, Pasadena, Calif.), and S. H. ALADZHADZHYAN, inventors (to NASA) (JPL, Pasadena, Calif.) 9 Apr. 1985 17 p
(Contract NAS7-918)
(NASA-CASE-NPO-16061-1-CU; NAS 1.71:NPO-16061-1-CU; US-PATENT-APPL-SN-729768) Avail: NTIS HC A02/MF A01 CSCL 20H

An electron gun is used with a mirror electrostatic field to produce zero or near zero velocity electrons by forming a turning point in their trajectories. A gas capable of attaching zero or near zero velocity is introduced at this turning point, and negative ions are produced by the attachment or dissociative attachment process. Operation may be continuous or pulsed. Ions thus formed are extracted by a simple lens system and suitable biasing of grids.
NASA



N85-30779*# National Aeronautics and Space Administration. Pasadena Office, Calif.
DOUBLE PHOTON EXCITATION OF HIGH-RYDBERG ATOMS AS A LONG-LIVED SUBMILLIMETER DETECTOR Patent Application
A. CHUTJIAN, inventor (to NASA) (JPL, Pasadena, Calif.) 21 Feb. 1985 15 p
(Contract NAS7-100)
(NASA-CASE-NPO-16372-1; NAS 1.71:NPO-16372-1; US-PATENT-APPL-SN-703847) Avail: NTIS HC A02/MF A01 CSCL 20H

A method and apparatus for detecting submillimeter or IR radiation is disclosed. A rare gas, such as xenon, is supplied at its ground state via a pressurized cylinder and an adjustable leak valve into a cryogenically cooled detection area. The ground state of xenon is double photon excited to a particularized level of the Rydberg series by a resonance lamp and a laser. The doubly excited gas is then further excited by the radiation to be measured. A field ionization and an ion measurement indicative of the radiation intensity is achieved.
Author



74

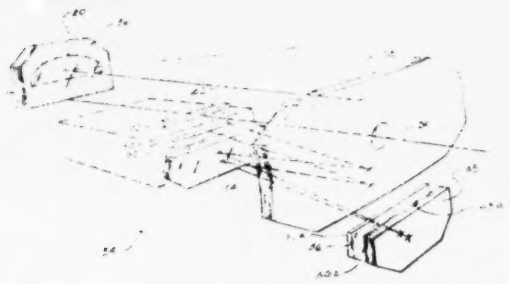
OPTICS

Includes light phenomena.

N85-23396* National Aeronautics and Space Administration. Pasadena Office, Calif.
OPTICAL SYSTEM Patent
J. B. BRECKINRIDGE (JPL, California Inst. of Tech., Pasadena), N. A. PAGE (JPL, California Inst. of Tech., Pasadena), R. V. SHACK (JPL, California Inst. of Tech., Pasadena), and R. R. SHANNON, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 5 Feb. 1985 14 p Filed 23 Mar. 1983 Supersedes N83-25541 (21 - 14, p 2320) Sponsored by NASA
(NASA-CASE-NPO-15801-1; NAS 1.71:NPO-15801-1; US-PATENT-4,497,540; US-PATENT-APPL-SN-478130; US-PATENT-CLASS-350-168; US-PATENT-CLASS-350-505; US-PATENT-CLASS-350-619; US-PATENT-CLASS-356-323; US-PATENT-CLASS-356-330; US-PATENT-CLASS-356-331)
Avail: US Patent and Trademark Office CSCL 20F

Disclosed is an otpical system used in a spacecraft to observe a remote surface and provide a spatial and spectral image of this surface. The optical system includes aspheric and spherical mirrors aligned to focus at a first focal plane an image of the surface, and a mirror at this first focal plane which reflects light back on to the spherical mirror. This spherical mirror collimates the light and directs it through a prism which disperses it. The dispersed light is then focused on an array of light responsive elements disposed at a second focal plane. The prism is designed such that it disperses light into components of different wavelengths, with the components of shorter wavelengths being dispersed more than the components of longer wavelengths to present at the

second focal plane a distribution pattern in which preselected groupings of the components are dispersed over essentially equal spacing intervals. Author



N85-29749* National Aeronautics and Space Administration. Pasadena Office, Calif.

OPTICAL FIBER COUPLING METHOD AND APPARATUS Patent

W. C. GOSS (JPL, Pasadena, Calif.), M. D. NELSON (JPL, Pasadena, Calif.), and J. M. MCLAUCHLAN, inventors (to NASA) (JPL, Pasadena, Calif.) 18 Jun. 1985 8 p Filed 26 Jan. 1982 Sponsored by NASA

(NASA-CASE-NPO-15464-1; US-PATENT-4,523,810; US-PATENT-APPL-SN-342828; US-PATENT-CLASS-350-320; US-PATENT-CLASS-156-166; US-PATENT-CLASS-350-96.15) Avail: US Patent and Trademark Office CSCL 20F

Systems are described for coupling a pair of optical fibers to pass light between them, which enables a coupler to be easily made, and with simple equipment, while closely controlling the characteristics of the coupler. One method includes mounting a pair of optical fibers on a block having a large hole therein, so the fibers extend across the hole while lying adjacent and parallel to one another. The fibers are immersed in an etchant to reduce the thickness of cladding around the fiber core. The fibers are joined together by applying a liquid polymer so the polymer-air interface moves along the length of the fibers to bring the fibers together in a zipper-like manner, and to progressively lay a thin coating of the polymer on the fibers.

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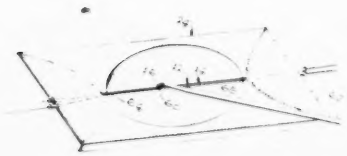

N85-29750* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,

LIGHT TRANSMITTING WINDOW ASSEMBLY Patent

D. L. CONNELLY, inventor (to NASA) 4 Jun. 1985 5 p Filed 16 Aug. 1983 Sponsored by NASA

(NASA-CASE-MSC-18417-1; US-PATENT-4,521,077; US-PATENT-APPL-SN-523559; US-PATENT-CLASS-350-319; US-PATENT-CLASS-350-312; US-PATENT-CLASS-350-321; US-PATENT-CLASS-52-171) Avail: US Patent and Trademark Office CSCL 20F

This invention provides a light transmitting assembly that can, at will, be changed from a state of transparency to one of translucency. It comprises two parallel spaced apart panes of transparent material, such as glass, with a film of polytetrafluoroethane, which is inherently translucent or opaque, disposed between. The assembly is rendered transparent by introducing a fluid into the assembly to substantially cover a surface of the film; the liquid having a refractive index corresponding to the refractive index of the film. The translucency is restored by removing the fluid.

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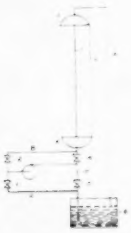

N85-34629* National Aeronautics and Space Administration. Pasadena Office, Calif.

RANGING SYSTEM WHICH COMPARES AN OBJECT REFLECTED COMPONENT OF A LIGHT BEAM TO A REFERENCE COMPONENT OF THE LIGHT BEAM Patent

J. M. MCLAUCHLAN (JPL, Pasadena, Calif.), J. AUYEUNG (JPL, Pasadena, Calif.), E. F. TUBBS (JPL, Pasadena, Calif.), W. C. GOSS (JPL, Pasadena, Calif.), and D. PSALTIS, inventors (to NASA) (JPL, Pasadena, Calif.) 6 Aug. 1985 8 p Filed 28 Sep. 1982 Supersedes N83-12991 (21 - 03, p 0455)

(NASA-CASE-NPO-15865-1; US-PATENT-4,533,242; US-PATENT-APPL-SN-425202; US-PATENT-CLASS-356-5; US-PATENT-CLASS-343-13-R) Avail: US Patent and Trademark Office CSCL 20F

A system is described for measuring the distance to an object by comparing a first component of a light pulse that is reflected off the object with a second component of the light pulse that passes along a reference path of known length, which provides great accuracy with a relatively simple and rugged design. The reference path can be changed in precise steps so that it has an equivalent length approximately equal to the path length of the light pulse component that is reflected from the object. The resulting small difference in path lengths can be precisely determined by directing the light pulse components into opposite ends of a detector formed of a material that emits a second harmonic light

output at the locations where the opposite going pulses past simultaneously across one another.

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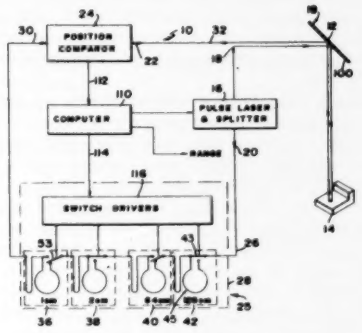

N85-30922* National Aeronautics and Space Administration. Pasadena Office, Calif.

LOW DEFECT, HIGH PURITY CRYSTALLINE LAYERS GROWN BY SELECTIVE DEPOSITION Patent

A. D. MORRISON, inventors (to NASA) (JPL, Pasadena, Calif.) and T. DAUD (JPL, Pasadena, Calif.) 11 Jun. 1985 6 p Filed 24 Jun. 1983 Supersedes N83-30269 (21 - 18, p 3028)
(Contract NAS7-100)
(NASA-CASE-NPO-15813-1; US-PATENT-4,522,661; US-PATENT-APPL-SN-507624; US-PATENT-CLASS-148-33.2; US-PATENT-CLASS-29-576E; US-PATENT-CLASS-29-576W; US-PATENT-CLASS-29-576J; US-PATENT-CLASS-29-578; US-PATENT-CLASS-148-175; US-PATENT-CLASS-148-DIG.26; US-PATENT-CLASS-148-174; US-PATENT-CLASS-156-612; US-PATENT-CLASS-156-DIG.65; US-PATENT-CLASS-156-DIG.88; US-PATENT-CLASS-357-4; US-PATENT-CLASS-357-50) Avail: US Patent and Trademark Office CSCL 20B

The purity and perfection of a semiconductor is improved by depositing a patterned mask of a material impervious to impurities of the semiconductor on a surface of a blank. When a layer of semiconductor is grown on the mask, the semiconductor will first grow from the surface portions exposed by the openings in the mask and will bridge the connecting portions of the mask to form a continuous layer having improved purity, since only the portions overlying the openings are exposed to defects and impurities.

Author

76

SOLID-STATE PHYSICS

Includes superconductivity.

N85-29800* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD FOR GROWTH OF CRYSTALS BY PRESSURE REDUCTION OF SUPERCRITICAL OR SUBCRITICAL SOLUTION Patent

P. J. SHLICHTA, inventor (to NASA) (JPL, Pasadena, Calif.) 23 Apr. 1985 12 p Filed 26 Jan. 1982 Sponsored by NASA
(NASA-CASE-NPO-15772-1; US-PATENT-4,512,846; US-PATENT-APPL-SN-392944; US-PATENT-CLASS-156-623Q; US-PATENT-CLASS-23-295R) Avail: US Patent and Trademark Office CSCL 20B

Crystals of high morphological quality are grown by dissolution of a substance to be grown into the crystal in a suitable solvent under high pressure, and by subsequent slow, time-controlled reduction of the pressure of the resulting solution. During the reduction of the pressure interchange of heat between the solution and the environment is minimized by performing the pressure reduction either under isothermal or adiabatic conditions.

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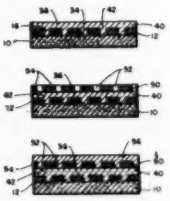

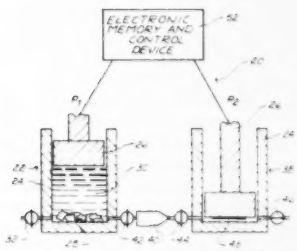

N85-30923* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

METHOD FOR DETERMINING THE POINT OF ZERO ZETA POTENTIAL OF SEMICONDUCTOR Patent

B. REICHMAN (Christopher Newport Coll.) and C. E. BYVIK, inventors (to NASA) 16 Apr. 1985 7 p Filed 31 Mar. 1982 Supersedes N82-26573 (20 - 17, p 26573)
(NASA-CASE-LAR-12893-1; US-PATENT-4,511,838; US-PATENT-APPL-SN-364041; US-PATENT-CLASS-324-71.5; US-PATENT-CLASS-204-1T; US-PATENT-CLASS-324-158D)
Avail: US Patent and Trademark Office CSCL 20L

A method to determine the potential of zero charge of an unpowdered semiconductor material is presented. The

semiconductor material is used as the working electrode of a standard three electrode photoelectrochemical cell. The onset potential of the semiconductor material is measured at several different cell temperatures. The slope of the graph of onset potential versus temperature is used to compute the potential of zero charge.

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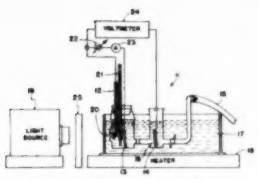


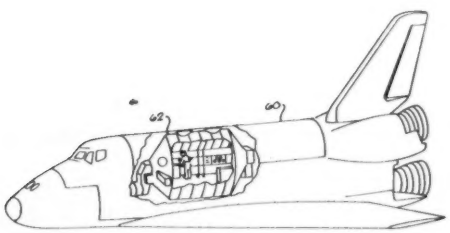
N85-30932*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

LASER SCHLIEREN CRYSTAL MONITOR Patent Application

M. H. JOHNSTON and R. B. OWEN, inventors (to NASA) 28 Feb. 1985 12 p

(NASA-CASE-MFS-28060-1; NAS 1.71:MFS-28060-1; US-PATENT-APPL-SN-706565) Avail: NTIS HC A02/MF A01 CSCL 20B

A system and method for monitoring the state of a crystal which is suspended in a solution is described which includes providing a light source for emitting a beam of light along an optical axis. A collimating lens is arranged along the optical axis for collimating the emitted beam to provide a first collimated light beam consisting of parallel light rays. By passing the first collimated light beam through a transparent container, a number of the parallel light rays are deflected off of the surfaces of said crystal being monitored according to the refractive index gradient to provide a deflected beam of deflected light rays. A focusing lens is arranged along the optical axis for focusing the deflected rays towards a desired focal point. A band is created at one edge of the image of the crystal which indicates the state of change of the surface of the crystal being monitored. NASA



N85-30933*# National Aeronautics and Space Administration. Pasadena Office, Calif.

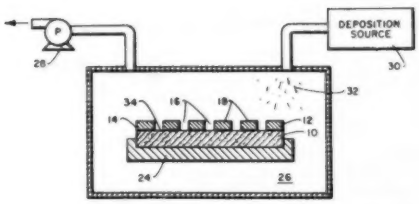
METHOD FOR GROWING LOW DEFECT, HIGH PURITY CRYSTALLINE LAYERS Patent Application

A. D. MORRISON (JPL, Pasadena, Calif.) and T. DAUD, inventors (to NASA) (JPL, Pasadena, Calif.) 28 Feb. 1985 13 p

(Contract NAS7-100)

(NASA-CASE-NPO-15813-2; NAS 1.71:NPO-15813-2; US-PATENT-APPL-SN-706564) Avail: NTIS HC A02/MF A01 CSCL 20B

A method for growing a high purity, low defect layer of semiconductor is described. This method involves depositing a patterned mask of a material impervious to impurities of the semiconductor on a surface of a blank. When a layer of semiconductor is grown on the mask, the semiconductor will first grow from the surface portions exposed by the openings in the mask and will bridge the connecting portions of the mask to form a continuous layer having improved purity, since only the portions overlying the openings are exposed to defects and impurities. The process can be reiterated and the mask translated to further improve the quality of grown layers. NASA



N85-30934*# National Aeronautics and Space Administration. Pasadena Office, Calif.

RIBBON GROWING METHOD AND APPARATUS Patent Application

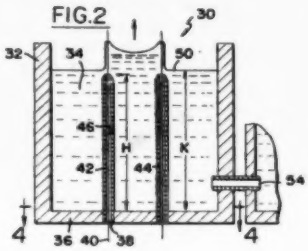
A. D. MORRISON, inventor (to NASA) (JPL, Pasadena, Calif.) 4 Apr. 1985 13 p

(Contract NAS7-918)

(NASA-CASE-NPO-16306-1-CU; NAS 1.71:NPO-16306-1-CU; US-PATENT-APPL-SN-719798) Avail: NTIS HC A02/MF A01 CSCL 20L

A method and apparatus are described which facilitate the growing of silicon ribbon. A container for molten silicon has a pair of passages in its bottom through which filaments extend to a level above the molten silicon, so as the filaments are pulled up they drag up molten silicon to form a ribbon. A pair of guides surround the filaments along most of the height of the molten silicon, so that the filament contacts only the upper portion of the melt. This permits a filament to be used which tends to contaminate the melt if it is in long term contact with the melt. This arrangement

also enables a higher melt to be used without danger that the molten silicon will run out of any bottom hole. Author



N85-33826* National Aeronautics and Space Administration. Johnson (Lyndon B.) Space Center,
LIQUID CRYSTAL LIGHT VALVE STRUCTURES Patent
N. J. KODA, inventor (to NASA) (Hughes Aircraft Co., Los Angeles, Calif.) 11 Jun. 1985 4 p Filed 9 Jan. 1984 Supersedes N84-22457 (22 - 12, p 1912)
(NASA-CASE-MSC-20036-1; US-PATENT-4,522,469; US-PATENT-APPL-SN-569372; US-PATENT-CLASS-350-342; US-PATENT-CLASS-204-192C; US-PATENT-CLASS-204-192P; US-PATENT-CLASS-428-432; US-PATENT-CLASS-428-698; US-PATENT-CLASS-428-913) Avail: US Patent and Trademark Office CSCL 30L

An improved photosensor film and liquid crystal light valves embodying said film is provided. The photosensor film and liquid crystal light valve is characterized by a significant lower image retention time while maintaining acceptable photosensitivity. The photosensor film is produced by sputter depositing CdS onto an ITO substrate in an atmosphere of argon/H2S gas while maintaining the substrate at a temperature in the range of about 130 C to about 200 C and while introducing nitrogen gas into the system to the extent of not more than about 1% of plasma mixture. Following sputter deposition of the CdS, the film is annealed in an inert gas at temperatures ranging from about 300 C to about 425 C. NASA

85

URBAN TECHNOLOGY AND TRANSPORTATION

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.

N85-34722* National Aeronautics and Space Administration. Pasadena Office, Calif.
SHUTTLE CAR LOADING SYSTEM Patent
E. R. COLLINS, JR., inventor (to NASA) (JPL, Pasadena, Calif.) 27 Aug. 1985 8 p Filed 14 Jan. 1983 Supersedes N83-20155 (21 - 10, p 1526)
(NASA-CASE-NPO-15949-1; US-PATENT-4,537,554; US-PATENT-APPL-SN-457990; US-PATENT-CLASS-414-328; US-PATENT-CLASS-414-288; US-PATENT-CLASS-414-373; US-PATENT-CLASS-414-786) Avail: US Patent and Trademark Office CSCL 13F

A system is described for loading newly mined material such as coal, into a shuttle car, at a location near the mine face where there is only a limited height available for a loading system. The system includes a storage bin having several telescoping bin sections and a shuttle car having a bottom wall that can move under the bin. With the bin in an extended position and filled with coal the bin sections can be telescoped to allow the coal to drop out of the bin sections and into the shuttle car, to quickly load the car. The bin sections can then be extended, so they can be slowly filled with more while waiting another shuttle car.
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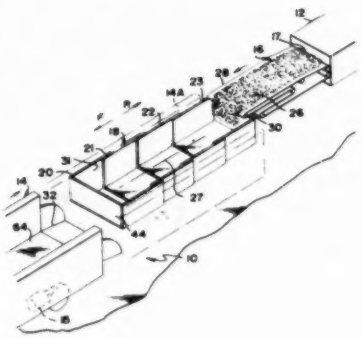

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7. Author(s)	8. Performing Organization Report No.
	10. Work Unit No.

9. Performing Organization Name and Address	11. Contract or Grant No.
National Aeronautics and Space Administration Washington, D.C. 20546	13. Type of Report and Period Covered

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15. Supplementary Notes

Section 1: Abstracts

16. Abstract

Abstracts are provided for 109 patents and patent applications entered into the NASA scientific and technical information system during the period July 1985 through December 1985. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application.

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